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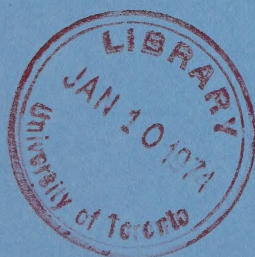
(Canada)



Report of the

CANADIAN GRAIN COMMISSION

1971



CANADA DEPARTMENT OF AGRICULTURE

Minister

Hon. H. A. Olson

Deputy Minister

S. B. Williams



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INFORMATION CANADA
OTTAWA, 1972

CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba,
February 28, 1972.

The Honorable H. A. Olson, M.P.,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

We are pleased to submit the 1971 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act.

The report contains a review of the Commission's principal activities during the year, together with information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1970-71 crop year, and a review of the quality of 1971 grain crops.

Respectfully submitted,

H. D. Pound,
Chief Commissioner.

C. L. Shuttleworth,
Commissioner.

F. Hetland,
Commissioner.

V. Martens,
Secretary.

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INTRODUCTION

The new Canada Grain Act passed by Parliament in 1970 was proclaimed by the Governor in Council to come into force on April 1, 1971. Under the provisions of this Act the Board of Grain Commissioners for Canada was re-named the Canadian Grain Commission.

The Canadian Grain Commission is responsible for administering the Canada Grain Act and has general supervision over grain handling in Canada. It has the power to make regulations and orders that are consistent with the Act.

The Commission's operations are divided into six main functions. The Executive Offices deal with general administrative matters, provide financial and personnel services, and include the offices of the Assistant Commissioners. The Inspection Division, which is the largest of the operational divisions, provides official inspection and grading of grain at various points across Canada, particularly grain received at and shipped from terminal elevators and grain loaded to vessels for export at transfer elevators. The Weighing Division is responsible for official weighing of grain at terminal and process elevators, annual weigh-overs of grain stocks in terminal and transfer elevators, and inspection and certification of scales in terminal and transfer elevators. The Economics and Statistics Division collects, compiles and publishes basic statistics relating to handling and storage of grain within the licensed elevator system. Other responsibilities include issuing of licences to elevator operators and grain dealers, supervision of bonding of licensees, and registration of elevator receipts issued by managers of terminal and transfer elevators. The Division is making increasing use of electronic data processing and telecommunication equipment in its services. The Research Laboratory carries on a program of research related to the quality of cereal grains and oil-seeds, conducts quality surveys of current crops and shipments, and participates in testing of new varieties in collaboration with plant breeders and the Commission's Inspection Division. The Canadian Government Elevators system, which is managed, operated and maintained by the Commission, is comprised of six terminal grain elevators located in Western Canada. One of the elevators is situated at the port of Prince Rupert, B.C. and handles grain for loading directly to ocean vessels.

In addition, the Commission constitutes Grain Appeal Tribunals and Western and Eastern Grain Standards Committees. It also has responsibility for collecting the 1 per cent levy under the Prairie Farm Assistance Act and for setting maximum lake grain freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

SECTION 1 — GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1970-71

Dramatically increased exports of Canadian grains were reflected in greater handlings for all sectors of the industry and the establishment of several new handling records in 1970-71.

The inward carry-over estimated at 1,370 million bushels of wheat, oats, barley, rye, flaxseed and rapeseed surpassed the previous record set July 31, 1969 by 172 millions. The proportion of supplies held in farm storage rose to 58%. The 1970 crop added 331.5 million bushels of wheat, 367.9 of oats, 415.7 of barley, 22.4 of rye, 48.9 of flaxseed, and 72.2 millions of rapeseed to available supplies. The August 1, 1970 carry-over combined with 1970 production provided 2,628 million bushels for export or domestic consumption.

The 795.1 million bushels of the six principal grains delivered by Canadian farmers to the licensed elevator system during 1970-71 represents an increase of 125 millions from the 1969-70 receipts and some 136 millions above the previous ten year average. Record highs were established by deliveries of barley (236.7 millions), flaxseed (33.7 millions), and rapeseed (61.5 millions) while, with the exception of 1961-62, the amount of wheat marketed (392.9 millions) was the lowest recorded during the past fifteen years.

Shipments of Canadian wheat, oats, barley, rye, flaxseed and rapeseed to overseas destinations and the United States amounted to a record breaking 671.7 million bushels. The previous high was recorded in the 1965-66 crop year when Canada cleared 635.6 million bushels. Shipments of barley (172.3 million bushels) and rapeseed (46.8 millions) represent all-time highs while exports of flaxseed (21.2 millions) were second only to the 1956-57 record of 21.6 million bushels. Wheat clearances of 409.4 million bushels were the heaviest volume moved since the 1966-67 crop year (482.7 million bushels).

Available supplies were reduced a further 852.4 million bushels by grain utilized in Canada for feed, seed, human food and industrial processing resulting in total commercial disappearance amounting to 1,558 million bushels. This disposition resulted in a year-end carry-over of 1,071 million bushels — representing a substantial reduction from the previous two year-end figures.

Quality of Grain Marketed in 1970-71

For most cereals and oilseeds, the grain marketed during 1970-71 consisted of some new crop material together with unknown amounts of grain from several previous harvests.

Hard Red Spring Wheat. Approximately 50% of the spring wheat qualified for the grades of No. 1 and No. 2 Northern. Only 6.5% of terminal elevator receipts were inspected as tough and very little artificial drying was necessary. The overall quality of the grades No. 1 Northern to No. 4 Northern, marketed in the 1970-71 crop year, was similar to that for the same four top grades marketed in the previous crop year. Protein content, alpha-amylase activity, milling quality, loaf volume (baking strength) and baking absorption data were almost identical grade for grade with the corresponding data for 1969-70.

The protein content of wheat cargoes exported from Atlantic ports in the crop year was slightly higher than for Pacific coast shipments. The baking strength for all grades of Atlantic shipments was correspondingly higher. Relative to Atlantic cargoes, shipments of grades 1, 2 and 4 Northern from Churchill were similar in protein content, but slightly lower in baking strength, while No. 3 Northern shipments, although slightly lower in protein strength, were similar in baking strength.

Amber Durum Wheat. The amount of durum wheat entering the top three grades in the 1970-71 crop year represented 74% of the carlots moved into market position. This indicated the above average quality of 1969 and 1970 crops. Test weight for No. 4 C.W. and No. 5 C.W. grades was higher than last year. Although pigment content for all grades except for the grade No. 5 C.W. was slightly lower, macaroni color was satisfactory.

Barley. The 1970 crop was harvested under good weather conditions and its quality was similar to that of the 1969 crop. For the third successive year, production set a new record at 391 million bushels for Western Canada. The C.W. grades of six-row and two-row barley amounted to 17.2% of the total, and No. 1 Feed was 54%. The malting quality of the higher grades was good and these shipments were above average in both percentage of plump kernels and freedom from weather damage. For the first time two-row barley was imported in substantial quantities — upwards of 6,000,000 bushels — into Europe for malting. This two-row barley came principally from central and southern Alberta, where acreage of this type of barley is increasing. Conquest increased in production among the six-row varieties.

Oats. There were 13,658 primary carlot shipments of oats, a 61% increase in volume over the previous crop year. Over 20% of shipments were in the milling grades, No. 3 C.W. or higher, as compared to 14% in 1969-70. The general quality was improved and not seriously affected by mildew or weathering.

Rye. The 1970 crop was harvested under relatively good conditions, and contained somewhat less discoloration, weather damage and ergot than normal. Despite this, rye that was marketed was about

average quality and showed only slightly improved amylograph figures despite relative freedom from sprout damage. The total of 4,890 carlots moved to terminals represents a 24% increase over the previous crop year.

Flaxseed. Over 97% of the 16,439 carlots of flaxseed marketed in the 1970-71 crop year graded No. 1 Canada Western. Oil content for all grades average 42.4%, a slight increase compared to the previous crop year. The protein content of the oil-free meal, 40.0%, was 0.4% lower this year.

Rapeseed. The number of carlots shipped reached a record high of 26,576. Practically all carlots of rapeseed marketed in the 1970-71 crop year graded No. 1 Canada Rapeseed. Oil content averaged 44.6%, moisture free basis, very slightly lower than the level for the previous crop year. The protein content of the oil-free meal was 0.8% higher at 40.6%.

Domestic Mustard Seed. The volume of domestic mustard seed marketed, 771 carlots, was relatively the same as in 1969-70. However, average quality of both primary and export shipments was much better as a result of the good harvest weather in 1970. Just over 50% of all shipments were graded No. 1 Canada Western in all classes.

Domestic Buckwheat. The gradually expanding market for Canadian buckwheat has made for increased production and marketing. A total of 814 carlots were inspected in 1970-71 as compared to 535 and 366 in the two previous years. Average quality of the 1970-71 movement was No. 3 Canada Western and quite satisfactory to meet trade requirements.

Peas. The production of dry peas in 1970 was up about 29% over the previous year. Peas marketed were a little above average as to appearance and boiling quality and were very low in moisture content. A total of 221 carlots were officially inspected.

Canada Eastern Grains. The white winter wheat crop harvested in 1970 was about average quality with just over 72% grading No. 1 or No. 2 Canada Eastern and a further 10% No. 3 Canada Eastern. About 14% of carlots inspected were tough or damp, reflecting the wet weather of the late harvest in all crop districts that also caused some degrading account sprout damage. A high proportion of the barley crop moved directly to maltsters and only 220 carlots were officially inspected. Approximately 90% of these were in the Canada Eastern malting grades despite some moderate weathering and mildew that occurred in all production areas. With carlot inspections of corn totaling 3,468, there was a 50% increase over last year. Of this total 96% were straight grade or extra dry No. 3 Canada Eastern or higher grade, and less than 2% were tough, damp, or moist account high moisture content. Soybean inspections were up nearly 50% from the previous year and crop quality was about the same with close

to 70% grading either tough, damp, or moist. About half of the 1970 pea bean crop was taken off in good weather and had excellent color. The balance suffered from wet harvest and was affected by adhered soil and lost color. Only 87 carlots were inspected of which 84 were either Extra No. 1 or No. 1 Canada Eastern.

Growing Conditions, Grades and Quality, 1971 Crop

The 1971 season was marked by generally good moisture and seeding conditions. By June 1, 90% of seeding was completed for the major spring crops. There were adequate and timely rains in most areas through to mid-July but crop development was hampered by the cool, showery weather. In the northern districts of Alberta and in western Manitoba excessive moisture was a continuing problem that caused flooding and soil erosion, making weed control difficult and some reseeding necessary. At the same time, drought conditions persisted over a large area of southern Alberta.

Hot, dry weather in the latter part of July and August speeded the development of both early and late seeded crops and as a result, harvesting in the drier areas was general in early August. The early harvest samples of wheat and barley showed moderately severe effects of premature ripening, but on the whole, shrunken grain is less of a factor than anticipated. Most crops were taken off in near ideal conditions, with the exceptions being the later crops from some of the northern areas of all three provinces.

Overall quality of the crop harvested is excellent, and the premature ripening appears to have again affected yield more than grade.

Red Spring Wheat. Hard red spring wheat production in Western Canada is estimated at 428 million bushels with a total carry-over estimated at 597 million bushels. The new crop is high in grade. About 68% will qualify for the new grade No. 1 C.W. Red Spring Wheat. A further 25% of the crop is expected to grade No. 3 Northern with the balance of about 7% falling into No. 4 Manitoba Northern and lower grades.

The new crop has an average protein content of 13.5%, just under the long-term average of 13.6%. It is estimated that when the new-crop No. 1 C.W. Red Spring Wheat moves forward to Atlantic shipping area terminal positions, the distribution among the various protein categories will be approximately: No. 1 C.W. 15, 3%; No. 1 C.W. 14, 40%; No. 1 C.W. 13, 50%; and No. 1 C.W. 12, 7%. At the Pacific coast the distribution is expected to be approximately: No. 1 C.W. 14.5, 15%; No. 1 C.W. 13.5, 65%; and No. 1 C.W. 12.5, 20%.

Following the introduction of protein segregation for the new grade No. 1 C.W. Red Spring Wheat (which replaced grades No. 1 Northern and No. 2 Northern, August 1, 1971), the 1971 new-crop composites for No. 1 C.W. Red Spring Wheat were made up according

to protein content — four levels (12, 13, 14 and 15%) for Eastern Prairie, and three levels (12.5, 13.5, and 14.5%) for Western Prairie material.

As seen in previous studies dealing with protein selection, increasing protein content produced an increase in baking quality as indicated by higher loaf volumes, baking absorption and loaf appearance, and crumb color scores. Although increasing protein content was concomitant with decreasing test weight and kernel weight, flour yield showed little change except for a slight decrease at the highest protein levels. Flour ash decreased and flour color increased with increasing protein content. Protein differences had little or no effect on alpha-amylase activity or Farinograph absorption, where lower protein was compensated for by higher levels of damaged starch.

In comparison with the quality of cargo shipments exported from Canada during the fourth quarter (May, June, July) of the 1970-71 crop year, the test weight of the new-crop wheat is lower for all grades. Protein content was significantly lower for Eastern Prairie composites of No. 3 and No. 4 Northern, and slightly lower for the No. 4 Western Prairie sample. The Eastern Prairie No. 1 C.W. 14 composite was similar in protein to Atlantic shipments of No. 1 and No. 2 Northern, while the Western Prairie No. 1 C.W. 13.5 sample was comparable to Pacific top grade shipments. Flour yields were slightly lower for all Western Prairie grades and for Eastern No. 3 Northern. However, flour color values were better for all new-crop samples. The alpha-amylase activity was lower in the new-crop No. 3 and No. 4 Northern samples, particularly in the Eastern Prairies, reflecting good harvest conditions with a minimum of weathering and sprout damage.

Baking quality, as indicated by loaf volume, was markedly lower, for the protein content, for all grades, indicating a "green" characteristic seen to a lesser extent in the 1970 crop and which is expected to improve with storage of the new crop.

Amber Durum Wheat. The 1971 amber durum wheat crop is estimated to amount to 59.5 million bushels (1.62 million metric tons) compared to last year's production of 80.9 million bushels. Average protein content of the new crop is 13.1%, up 0.2% from last year, and the average test weight is 66.8 lb. per bushel, slightly lower than last year. Over 70% of the new crop is expected to grade No. 3 C.W. or higher. The principal degrading factor is green immature kernels. Other minor degrading factors were blackpoint, smudge and starchiness.

Pigment level is appreciably lower in the grade Extra No. 4 C.W. but higher in No. 4 C.W. and No. 5 C.W. grade. Macaroni color especially for the grades No. 4 and No. 5 C.W. is better.

Barley. Another record crop — 641 million bushels — of barley was produced in 1971 in Western Canada. Practically all of the crop

was harvested under ideal conditions. A hot spell during July in southern Alberta and western Saskatchewan caused some premature ripening of grain and reduced kernel size. On the average, the Western Canadian barley, and especially the 3 C.W. two-row grade, is lower in percentage plump barley than last year, but the malting quality of the plump barley is excellent and similar to that of last year's crop.

Flaxseed. The new flaxseed crop of 25.5 million bushels represents a decrease of over 23 million bushels from last year's record production. Almost all of it will enter the No. 1 Canada Western grade. Oil content of 41.3% is 0.7% lower than last year's new-crop estimate, protein content of the oil-free meal was 0.8% higher at 42.4% with iodine values about the same.

Rapeseed. The 1971 rapeseed crop estimated at 98.5 million bushels is an increase of approximately 26 million bushels over last year's record production. Compared with estimates of last year's crop, oil content is 0.7% lower at 43.3% and protein content of the oil-free meal 0.4% lower at 39.6%. Rapeseed varieties with low erucic acid levels were marketed for the first time. Almost all of the rapeseed crop will grade No. 1 Canada Rapeseed.

Eastern Winter Wheat. White winter wheat production in Ontario in 1971 was estimated at 14.0 million bushels. The protein content of the 1971 crop was estimated by the Commission's Research Laboratory to be 10.7% compared with 9.9% for the 1970 crop. The predominant grade in the 1971 crop survey was No. 2 Canada Eastern White Winter Wheat and represented 56% of the samples.

Eastern Canadian Soybeans. Soybean production in Eastern Canada in 1971 was estimated at slightly more than 10 million bushels, almost the same as in 1970. Based on the Commission's Research Laboratory survey, the average oil content of the new crop was 20.4% on a moisture-free basis, with a range of 18.4 to 22.2%. The protein content of the oil-free meal, also on a moisture-free basis, was 55.0% with a range of 48.6 to 57.9%.

Canada Eastern Corn. Despite some growing season drought, the 1971 crop matured fairly well and the average of inspections had a test weight in excess of 56 pounds.

Meetings of Grain Standards Committees

The Western Grain Standards Committee met in Winnipeg on November 9 and 10, 1971. The Committee received a report given by the Chief Grain Inspector on 1971 crop conditions and the factors affecting the grades and quality of grain harvested. Nearly 1,000 two-bushel bags of the various grains were collected by the Inspection Division for testing and use in preparation of 51 tentative standard and

export standard samples. These samples were presented to the Committee on November 10, and 41 were recommended as standard samples of statutory grades of grain and 8 as export standard samples for the principal grades of red spring and amber durum wheat. The Committee also approved and recommended that the Commission establish export standard samples for No. 1 and No. 2 feed barley grades. In addition, special reports were presented to the Committee on the Commission's tentative proposals for establishing and implementing new or amended grades for western grain, and on the implementation and performance of the protein-segregation system for the No. 1 Canada Western red spring wheat for the period August 1 to November 1, 1971. The details of laboratory studies and investigations on the quality of new crop grains, and on the tentative 1971 standard and export standard samples of red spring, amber durum wheat, barley and oilseeds, were reported to the Committee by the Commission's Chief Chemist.

The Eastern Grain Standards Committee had two meetings in 1971. At the first held in London, Ontario, on September 2, 1971, the quality of the early harvested crops was reviewed and 17 samples were established by the Committee as standard samples for the grades of white winter wheat, oats, barley, and rye. The Committee also recommended continuing the provisions for "Special" designation after the No. 3 and No. 4 Canada Eastern white winter grades to classify wheat otherwise No. 2 C.W. quality but containing over 5%, but not over 8% and 12% of sprouted grains respectively. At its second meeting held in Montreal on October 28, 1971, the Committee established 16 samples as standard samples of statutory grades of corn, soybeans, domestic buckwheat and pea beans.

Both Eastern and Western Committees received brief reports on matters related to research in cereals and other grains from Dr. J. W. Morrison, of the C.D.A., Research Branch, Ottawa. The members of the committees as appointed by the Commission are listed in Appendix B. This listing reflects the revised membership provided for in Section 17 of the new Canada Grain Act.

Variety Testing

The Inspection Division extended its service to Canadian plant breeders to include a far greater number of samples of early cross breeders lines of types and varieties being developed in the search for high-yielding feed grains. Samples examined and reported on for visual characteristic factors were in excess of 3,100. The division provided the Canada Committee on Plant Breeding and the Committee on Grain Quality with detailed reports on the varietal identification characteristics of 65 varieties of red spring, amber durum, and barley, that were grown in the 1971 co-operative variety tests.

Each year the Canada Committee on Grain Quality evaluates the potential acceptability of new varieties of cereal grains grown in the Co-operative Test. The Commission's Research Laboratory conducted detailed quality tests on the new test varieties of hard red spring wheat, amber durum wheat, and malting barley grown in 1970. Included in this test were 14 varieties of hard red spring wheat, 21 varieties of durum wheat and 51 varieties of barley.

Two new and promising varieties of hard red spring wheat have reached advanced stages of quality testing and are now being evaluated in a domestic collaborative test in the main Canadian cereal laboratories.

An international collaborative test was conducted on three promising varieties of durum wheat. Of these one was licensed under the name of Wascana. Its superiority lies in its high pigment content and better cooking quality.

Of the 51 barley varieties tested, five were subjected to the extensive pilot malting and brewing tests. Two of these were six-row varieties and they failed to meet quality standards. Three were two-row varieties in the first year of such tests and these will be tested for another year.

Again in 1971 as in previous years, the Grain Research Laboratory took part in the annual wheat quality evaluation program of the Crop Quality Council of the United States. A total of 25 flour samples was tested. In this way it was possible to have information on American wheat varieties that are being developed as well as to keep abreast of their testing and evaluation procedures.

SECTION 2 — DOCUMENTATION AND ELEVATOR OPERATIONS

Grain Documentation

Statistics. Licensees are required to submit certain records and periodical reports of stocks and handlings of grain as a basis for the Commission's control and supervision of the elevator system. The Economics and Statistics Division also receives corresponding data from other Divisions of the Commission, from the Canadian Wheat Board and from other organizations and associations within the grain trade. From this information the Division compiles and publishes comprehensive bulletins relating to the storage and movement of Canadian grain within the Canadian elevator system and to domestic and export markets. Throughout the year these reports were distributed to Canadian and overseas correspondents and also served as a basis for supervisory and regulatory assessments within the Commission, the Canadian Wheat Board and related agencies.

As the principal source of Canadian grain storage and handling statistics the Division worked closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, and other federal and provincial government offices. On a correspondent basis it exchanged data and provided statistical assistance internationally with the Commonwealth Economic Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the Production and Marketing Branch of the United States Department of Agriculture.

Summary statistics pertaining to the 1970-71 crop year appear in the tables forming part of Appendix A and a list of the principal statistical releases is included in Appendix C.

Licensing and Bonding. The new Canada Grain Act established several new licence classifications which were applied to licences issued or renewed effective August 1, 1971. The former country elevator classification became "primary elevator"; private terminal and mill elevators became "process elevators" and eastern elevator licensees became "transfer elevator" licensees. At August 1, 1971 the Commission issued a total of 4,937 licences for all elevator categories compared with 5,060 at August 1 of the previous year. Total licensed storage capacity decreased to 693,898,660 bushels from 700,013,260 bushels a year ago. A reduction of 4.9 million bushels occurred in the primary elevator storage system reflecting for the most part the closing of elevators at stations where the service was no longer required. The terminal sector remained unchanged while reductions in the process and transfer elevator classifications resulted largely from the changed definitions and the new type of classification rather than reflecting any essential change in the capacity of that

part of the system. A substantially increased volume of transfer of licence applications involving the exchange of primary elevator ownership between companies reflected intensified efforts on the part of the companies towards consolidating services and restrained cost increases. A summary of licences in force and licensed storage capacity is contained in Table A-2.

Guarantee bonds in the amount of \$33,901,135 executed by 16 surety companies, were deposited with the Commission as security by licensees during the crop year 1970-71.

Terminal, transfer and primary elevator licensees were required to maintain adequate insurance on grain stocks in their licensed premises. The insurance policies supporting this coverage were filed with the Economics and Statistics Division and this Division in turn verified the adequacy of this coverage by comparison with the regular stock returns submitted by the licensee.

Registration. Operators of terminal and transfer elevators are required to issue warehouse receipts or transfer receipts for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration become negotiable documents to be used as collateral by the grain companies in financing the movement of the grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver and Montreal the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipment. In co-operation with the Canadian Wheat Board the Division introduced new requirements governing the registration and cancellation of transfer elevator warehouse receipts covering grain moving to Atlantic seaboard ports for export. The Division further refined its automated procedures recently implemented with respect to the preparation of these documents within the terminal elevator sector serviced through its Winnipeg office and completed plans for the extension of this automation to its Vancouver office.

Primary Elevators

Inspection of Elevators. The Commission's four Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Edmonton, kept the Commission in close touch with the operations of licensed primary elevators in the Prairie Provinces.

During the year 1971, the Assistant Commissioners inspected 553 elevators in Manitoba, 852 in northern Saskatchewan, 641 in southern Saskatchewan and 468 in Alberta, a total of 2,514. This inspection included checks on scales, sieves, moisture meters and certain other equipment; deductions for shrinkage and Prairie Farm Assistance Act Levy, and posting of current Commission regulations applying to primary elevators.

In addition to this regular program of inspections, the Assistant Commissioners assisted in the investigation of producers' complaints and of reported infractions of the Commission's regulations and orders. They also received and handled numerous inquiries from producers and elevator operators on various matters relating to primary elevator operations.

Weigh-overs. The results of the 1970-71 primary elevator weigh-over program conducted by licensed grain companies have been summarized in the following table. A large number of these weigh-ups included grain delivered from the high moisture crop of the 1968-69 season and as such reflect the difficulties of handling grain under those conditions.

The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners were given authority to deal directly with elevator managers and superintendents where excessive overages or shortages had been reported.

Elevators reporting	1970-71	1969-70
Shortages	429	431
Neither overages nor shortages	51	32
Overages of less than .25%	265	432
Overages of .25% to .50%	320	254
Overages over .50%	360	172
Total number of elevators weighed over	1,425	1,321

Tariff of Charges. During the crop year 1970-71 the maximum elevation charge for handling of wheat at primary elevators was 3¾ cents per bushel. Effective August 1, 1971 the free storage period for all grains was reduced from 15 days to 10 days.

Terminal, Process and Transfer Elevators

Services. All grain received at and shipped from licensed terminal elevators in the Western Division was sampled and graded by staff of the Inspection Division, and weighed under supervision of the Commission's weighing staff. Inspection and weighing services were also provided at licensed process elevators in the Western Division.

At licensed transfer elevators located at St. Lawrence River and Maritime ports, grain loaded into vessels for export was sampled, and inspected and certified. Other sampling, inspection and weighing services in the Eastern Division were provided only on request. The inspection unit at Chatham, Ont., sampled and graded a considerable volume of eastern-grown grain for the grain trade in that area.

Information as to quantity of grain inspected and weighed during the 1970-71 crop year is given in Appendix A.

The Commission is re-evaluating its role in the weighing of grain in terminal and transfer elevator positions, and its general supervision of all elevator weighing facilities and practices, particularly the use of the newer automated types of grain elevator scales. A special consultant was retained to study and report on this area of the Commission's activities.

Terminal Elevator Grain Drying. During the 1970-71 crop year, approximately 16 million bushels of high moisture grain were artificially dried at terminal elevators under supervision of the Commission's Inspection Division, compared with some 72 million bushels in the previous year. This reduction reflected the improved condition of crops harvested in the fall of 1970.

Weigh-overs. Whenever possible, official weigh-overs are conducted annually at licensed terminal and transfer elevators by groups of employees of the Weighing and Inspection Divisions. While a weigh-over is in progress, all normal elevator operations cease, and the grain handling equipment and stocks of grain remain under the full control of the weigh-over crew. The contents of every storage bin are weighed, sampled for verification of grade and recorded. This work may take from a few days to several weeks, depending on the size of the elevator and the quantity and type of grain in store. The Economics and Statistics Division compiles totals of outstanding elevator receipts and handlings by grain and grade, obtains statements of stocks on hand from the Weighing Division and summarizes the results of each weigh-over for review by the Commission. The purpose of these audits is to enable the Commission to determine whether the grain handling operations at the elevator have resulted in any excessive overage or shortage in the various kinds and grades of grain.

During the 1970-71 crop year, 22 terminal and 6 transfer elevators were weighed over. An additional 9 terminal elevators were weighed over before the end of December, 1971

Inspection of Equipment. All automatic samplers, scales and equipment for transferring grain to scales on receipt, and from scales for shipment in all licensed terminal elevators and serviced process and transfer elevators were inspected periodically. In accordance with the special arrangement with the Standards Branch of the Department of Consumer and Corporate Affairs, all scales in licensed terminal and transfer elevators were inspected, verified and certified by the Commission's scale inspectors acting as inspectors under the Weights and Measures Act. Special inspections were made when any doubt arose as to the accuracy of a scale.

Plans and specifications for new elevator facilities and alterations to elevators and grain handling equipment were examined before

permission was given for commencement of work by elevator managers. A total of 15 such projects were reviewed, including installations of dust control systems, automatic scales and vessel loading facilities. When completed, new facilities and installations were inspected by officials of the Inspection and Weighing Divisions to ensure that no condition existed which might affect the efficiency of sampling or the accuracy of the weighing of grain received and shipped.

New Equipment. The Inspection Division, in co-operation with elevator management, arranged for further installations of pneumatic sample transport systems in terminal elevators at Thunder Bay and Vancouver. The Commission has provided a total of 35 of these transport systems to improve car unload grade information service to the elevator operators. This new equipment has been found particularly useful in connection with implementation of protein segregation of red spring wheat.

Manually operated scales in several elevators in both the Western and Eastern Divisions were modified by the elevator managers to allow automatic control and operation. This new scale equipment was subjected to very thorough tests by scale technicians on the staff of the Commission's Weighing Division.

Tariffs of Charges. During 1971, the maximum elevation charge for handling of wheat, oats and barley at licensed terminal elevators at Thunder Bay, the Pacific Coast and Churchill was 4 $\frac{3}{8}$ cents per bushel. The maximum tariffs of charges for both terminal and transfer elevators were amended effective April 1, 1971 by eliminating the five day free storage period. Also, in the transfer elevator tariff, the basic elevation charge and some additional charges for receiving and shipping were increased by \$1.25 per 1,000 bushels.

Safety Program. Working and safety conditions for Commission employees located at grain elevators at terminal points were under constant review during the year and regular inspections were carried out at elevators in the Lakehead, Pacific Coast and eastern areas. Recommendations for improvements in lighting, dust control, signal systems and other facilities were sent to elevator managers as part of a program to have conditions brought up to an acceptable and uniform standard. Most firms operating terminal and eastern elevators co-operated with the Commission by carrying out requested improvements to work areas where Commission employees provide grain inspection and weighing services.

Local safety committees at Thunder Bay and the Pacific Coast maintained a program of work safety instruction and enforcement, and liaison with officials of the Canada Department of Agriculture and the Canada Department of Labour in connection with various aspects of the safety program at grain elevators.

Canadian Government Elevators

The Commission manages and operates six terminal elevators which comprise the Canadian Government Elevators System. Five of the elevators are located in the Prairie Provinces and one at the Pacific seaboard.

Handlings. Receipts during the 1970-71 crop year totalled 18.4 million bushels, and shipments 24.6 millions. The latter figure was almost equal to the all-time record and included 12 million bushels of wheat from the Prince Rupert elevator and 7 million bushels from the interior elevators. The Calgary elevator handled 1.5 million bushels of barley for the local malting trade. Rapeseed handlings at the interior elevators amounted to 3.2 million bushels, in addition to significant quantities of mustard seed, flaxseed, safflower seed and canary seed. Several grain companies made special arrangements to enable producers to deliver grain directly to the Moose Jaw and Saskatoon elevators. In December, 1971 the Saskatoon elevator participated in an experimental unit train shipment of 90 carloads of wheat to Vancouver for direct loading to an ocean vessel through a bulk loading facility at that port. Receipts and shipments at the various elevators were as follows:

Elevator	Capacity	Stocks August 1, 1970	Receipts	Shipments	Stocks July 31, 1971
		— thousands of bushels —			
Moose Jaw	5,500	4,721	846	3,323	2,244
Saskatoon	5,500	5,069	580	3,441	2,208
Calgary	2,500	1,870	2,279	2,637	1,512
Edmonton	2,350	1,184	2,329	2,548	965
Lethbridge	1,250	870	154	241	783
Prince Rupert	2,250	1,392	12,204	12,440	1,156
Totals	19,350	15,106	18,392	24,630	8,868

Charges. During the crop year 1970-71, charges were the maximum permitted by the Canada Grain Regulations except that storage charges at the interior elevators on wheat, oats and barley were 1/45c per bushel per day instead of 1/30c. Effective August 1, 1971 the elevation charge for rapeseed was reduced to 6c per bushel from the maximum allowable charge of 6 $\frac{7}{8}$ c. This was done to facilitate the use of the elevators for handling part of the record rapeseed crop produced in 1971.

Equipment. The program of modernizing cleaning equipment was continued by the installation of new cleaners at the Saskatoon elevator. Replacement of motors and drives at the Prince Rupert elevator was undertaken, and it is planned to make similar improvements at the other elevators during the next few years to comply with electrical and labour safety codes.

Complaints and Inquiries

Producers' Complaints. During 1971, the Commission and the Assistant Commissioners investigated nine written complaints about producer transactions with operators of licensed primary elevators. In most cases, it was possible to arrange satisfactory settlements between the parties concerned.

In addition, the Assistant Commissioners dealt with a variety of informal complaints and, when necessary, interviewed elevator managers and local superintendents to advise on correct procedure.

Cargo Shortage Complaints. The Commission received a total of twelve complaints about excessive shortages reported on vessel shipments unloaded at Eastern Canadian ports. Most of these shipments originated at Thunder Bay and the Chief Weighmaster arranged with senior members of his staff to investigate the weighing and loading of the grain at the terminal elevators concerned. In regard to the unloading of the shipments at licensed eastern elevators, an official of the Weighing Division examined records and interviewed elevator personnel. The Chief Weighmaster reported his findings to the Commission for review and forwarding to the complainants.

In addition, nine complaints were received about outturn weights reported from overseas destinations. Investigations were conducted into the weighing of the shipments at the loading elevators in Canada and reports were forwarded to the complainants; no evidence was found to account for the reported shortages in weight. The Commission also reviewed information supplied by the complainants on unload procedures and equipment at the overseas ports.

Overseas Quality Complaints. A total of 16 complaints were received about aspects of the quality of grain shipped to overseas destinations. Thorough investigations were carried out by the Inspection Division or the Research Laboratory, depending on the nature of the complaint. Official samples taken from the shipments at the time of loading were studied and subjected to special tests. Where possible, these samples were compared with samples taken by the importers at the time of unloading overseas. Detailed reports of the Commission's investigations were sent to complainants for their information. On the basis of the tests on the loading samples, no justification was found for the complaints.

Prosecutions. During 1971, at the request of the Commission, the R.C.M.P. filed charges in court in connection with the alleged storage of grain outside of licensed premises in violation of Section 19 of the Canada Grain Regulations. The licensee concerned was found guilty of this offence and fined by the court.

SECTION 3 — RESEARCH, INFORMATION AND OTHER SERVICES

Research

Laboratory Research. The Research Laboratory has continued its search for new knowledge which forms the basis for a better understanding and solution of practical problems in the field of cereal science.

Another sulfhydryl peptide that is naturally present in wheat germ has been isolated and its properties are being characterized. It is one of three sulfhydryl compounds that are involved in the mechanism of improper action in flour.

By a technique using gel electrophoresis, it has been found that alpha-amylase in immature hard red spring wheat has three forms, while that from germinated wheat has eight forms. This technique can be used to analyze "sound" wheat varieties that have low amylograph viscosities or falling numbers.

An automated method based on the use of reduced beta-limit dextrin has been developed for the routine determination of alpha-amylase activity in amylase sources normally used as breadmaking additives.

Studies on mechanical dough development have been continued. The mechanical efficiency and mixing efficiency of various laboratory dough mixers have been evaluated and knowledge gained has been applied both in interpretation of wheat quality and in the design of a larger mixer for use in the technical services laboratory. Results from experiments with L-cysteine hydrochloride which is becoming more widely used in commercial breadmaking, have given a clearer understanding of how this ingredient enables mechanical dough development to be achieved with significantly lower energy levels, shorter mixing times and with mixers of slower speeds.

The development of an experimental mill with six-inch diameter rolls has been completed and the roll feeding system refined to enable accurate measurement of work requirements during grinding. A comparison with the laboratory Allis Chalmers mill is now at an advanced stage. Four stands of ten-inch diameter mill rolls are currently under development. This project is part of a program to provide a more comprehensive assessment of wheat milling quality, as related to commercial practice, to be made in the laboratory.

The laboratory provides the basic service of protein testing in the new program of segregating No. 1 C.W. wheat into categories with guaranteed minimum protein content. The protein operation involves two laboratories, one in Winnipeg and a new one in Calgary. The

material processed consists of primary inspection samples, boxcar unload samples and cargo samples. During 1971 a total of 310,000 samples was processed by the Winnipeg laboratory and about 80,000 samples were analyzed at Calgary. The accuracy of the two laboratories is very carefully monitored at all times by means of four different check sample procedures. During 1971 the overall precision has been plus or minus 0.13 percentage units.

A number of basic statistical studies was also undertaken by the laboratory in projecting the course of and control of the operations on protein grading of wheat.

In durum wheat studies on factors affecting spaghetti quality are continuing. It has been observed that varieties of durum wheat with weak gluten tend to be higher in gliadin content, give higher turbidity in the Berliner test and are more extensible in the extensibility test developed in this laboratory.

A survey of pigment content based on carlots of durum wheat unloaded at Thunder Bay during the fourth quarter of 1970-71 crop year indicated lower values for durum wheat originating around Regina and Rosetown in Saskatchewan. Another survey was carried out on the pigment content in the new variety of durum, Hercules. The average pigment content based on 700 samples was 6.8 p.p.m.

In barley research, the separation and characterization of barley and malt amylase enzyme components continued to be of major interest. Alpha-amylase has been separated into two major components, and comparisons have been made between different typical alpha-amylases of barley and malt. Electrofocussing procedures have been useful in this study. The origin of alpha-amylase in developing barley kernels has also been studied and has been shown to be present mainly in the pericarp. Malt beta-amylase has been separated into a number of components and these will be compared with components of barley.

A highly sensitive analytical method capable of determining mercury in parts per billion has been developed for cereals and oilseeds. This method has been used to study natural environmental levels of mercury in cereal grains.

As in previous years, all cargoes of hard red spring and amber durum wheats and of all barleys leaving Canada for overseas destinations were monitored for possible presence of organochlorine and organothiophosphate pesticide chemical residues. Improvements have also been made in the analytical procedures employed, both to increase the speed of analysis, and to make the identification more specific.

A new service is being provided this year in analyzing for erucic acid content new varieties of rapeseed, Oro and Span, which were

grown for the first time by Western Canadian farmers. The new varieties are desirably low in erucic acid, but are visually indistinguishable from the earlier varieties. Chemical analysis is used as a basis of segregation of these two types of rapeseed.

Statistical and Economic Studies. The program of continuing studies of grain handling costs developed by the Economics and Statistics Division was further expanded during the year. In co-operation with the Grains Group and with technical assistance from the industry the Division conducted a detailed study of grain cleaning operations in Canadian elevators and a special review of cleaning costs within those terminal elevators operated by the Canadian Government Elevator Division of the Commission. Analytical reports in all of these areas were provided to the Commission members to keep them informed of the adequacy of present levels of handling and storage tariffs within the industry. The research unit of the Division participated in the development of control data and control systems related to the introduction of protein as a factor in the grain grading system. This will be a continuing function of that Division in both the statistical research area and in the application of computer oriented control systems.

The Director of the Division continued to represent the Commission on the Grain Transportation Technical Study Group; this body includes all elements of the grain handling industry—government agencies, elevator companies and major railways—joined together in a common research effort to co-ordinate and plan Canada's western grain transportation system. The Director chaired a sub-committee dealing with all aspects of documents, records, reports and data communication within the western grain trade. This is part of a long range program of the Technical Group and of the Economics and Statistics Division to systematize and automate the grain industry management information system.

Revision of the Canada Grain Act. The new Canada Grain Act passed by Parliament on December 18, 1970 was proclaimed by the Governor in Council to come into force on April 1, 1971. This necessitated a detailed review and revision of the Canada Grain Regulations, in conjunction with officials of the Department of Justice, so that the Regulations would be consistent with the provisions of the Act.

Information Program

Publications. The Commission issued a series of bulletins to provide wheat producers, elevator operators, exporters, millers and overseas purchasers with detailed information about Canada's new grades of red spring wheat. The first of these new grades was introduced on August 1, 1971 and the others will become effective on August 1, 1972. The principal bulletin was made available in several languages for overseas distribution.

The Commission also published and distributed a revised handbook which deals with varietal identification of barley, wheat and small oilseeds by kernel characters. This publication was compiled by senior staff of the Inspection Division and printed with full colour photographs of the grain kernels. A revised handbook entitled "Sale and Handling of Grain through a Primary Elevator" and containing extracts from the new Canada Grain Act and Canada Grain Regulations was printed and distributed to licensees of primary elevators.

Statistics on the movement and storage of grain within the licensed elevator system were published and distributed regularly through a series of bulletins issued by the Economics and Statistics Division.

The Research Laboratory publishes a separate annual report providing a comprehensive summary of its activities. However, brief reference to some of the highlights of Laboratory activities is made at appropriate points throughout this report. Results of Laboratory research projects, totalling 11 papers in all, were published in scientific and technical journals.

The Commission's publications are listed in Appendix C.

Meetings. Members of the Commission and senior officials accepted a number of invitations to address annual meetings of producer organizations and to discuss topics of current interest relating to the Commission's work. In addition, they attended meetings held by several agricultural and other organizations including the Canada Grains Council, National Farm and Business Forum, Hudson Bay Route Association, and university faculties of agriculture.

Members of the Laboratory's professional and senior technical staff attended a total of 18 scientific and technical conferences. A complete listing is included in the Laboratory's Annual Report.

The Commission convened regular meetings of the Western and Eastern Grain Standards Committees.

Overseas Visits. Missions composed of senior officials and technical experts of the Commission visited Europe, the United Kingdom, Japan and Hong Kong. The purpose of these missions was to meet with importers, millers, cereal research and government personnel and provide them with detailed information about the new grade of Canadian wheat, No. 1 C.W. Red Spring, which went into use on August 1, 1971. Discussions also dealt with the minimum protein guarantee relating to this new grade, changes in grade specifications for amber durum wheat, proposed additional new wheat grades to become effective in 1972, and the quality of 1971 crops of Canadian grains and oilseeds. Members of the Research Laboratory staff visited research institutes in several Asiatic and European countries and Great Britain.

Tour of Commission Facilities. Many individuals and groups visited the Commission and toured its inspection and laboratory facilities, to discuss matters related to the grain trade and to obtain first

hand information about the functions and services of the Commission. These visitors included missions sponsored by the Canadian Wheat Board and other organizations from Australia, Austria, Bulgaria, China, France, Hong Kong, Japan, Peru, Philippines, South Africa, Switzerland, United Kingdom, and U.S.S.R.

Special arrangements were made to provide tours and lecture sessions for groups of country elevator managers, university students in agriculture, and Assistant Trade Commissioners-in-Training from the Department of Industry, Trade and Commerce.

Films. The Commission's films, 'Canadian Wheat' and 'Grain Handling in Canada' were shown to many interested individuals and groups.

Mobile Exhibit. The exhibit was placed on display at 15 agricultural fairs or exhibitions in Manitoba, Saskatchewan and Alberta, and was visited by over 5,000 persons, principally grain producers and country elevator managers. Members of the Commission's staff were in attendance to give information and advice to interested parties about the Commission's functions and services. Special emphasis was placed on varieties and grades of grain and the displays featured samples of the new No. 1 C.W. Red Spring Wheat grade, Hercules variety amber durum wheat, and the low erucic acid varieties of rapeseed. Information was provided about such matters as protein segregation of wheat, recent changes in grades and grade specifications, handling of rapeseed at primary elevators, and control of stored grain insects.

Other Services

Pesticide Residue Monitoring. During the year, 1,275 cargoes of hard red spring wheat, 275 cargoes of amber durum wheat, and 875 cargoes of barley were checked for chemical pesticide residues to assure their acceptability in market areas where Canadian grain is used.

Entomological Surveys. As a result of the above-average number of infested carlots of grain which were detected during the previous year, increased emphasis was placed on interception and control techniques throughout the grain handling system to reduce the incidence of insect infestations and prevent detectable insect populations from entering grain destined for export. In collaboration with officers of the Plant Protection Division studies and detailed inspections were carried out on railway cars, lake vessels, transfer elevators and ocean vessels in a continuing program to improve areas of possible contamination and cross-infestation.

The Commission's Inspection Division and the Plant Protection Division of the Department of Agriculture have developed a revised

program of inspection of lake vessels before loading at Thunder Bay and during unload at St. Lawrence ports. In cases where cereal insects were detected in the vessels, instructions were issued to the ships' masters for adequate corrective measures. During the 1971 shipping season inspections were carried out on 145 vessels, and there was a noticeable improvement in the level of sanitation.

The Commission's entomologist and staff made periodic inspections of terminal and eastern elevators. Where insect infestations were observed in these premises, instructions were issued to the operators for appropriate clean-up and control measures. Approximately 2,800 samples taken from grain stored in the elevators were examined in the entomological laboratory and, in addition, 2,300 samples submitted by primary elevator managers were processed and the managers were supplied with reports and advice as to treatment required.

A district entomology laboratory was established at Vancouver in June, 1971 to facilitate a continuous insect monitoring program for that area, and plans were drawn up for a similar district laboratory to be located at Thunder Bay and operational early in 1972.

Moisture-Testing Equipment Service. The Research Laboratory continued its control of the accuracy of Model 919 moisture testers used throughout the various offices of the Grain Inspection Division across Canada. Check test service for Brown Duvel moisture testing equipment was discontinued upon the decision to drop this moisture-testing method from official status.

One new calibration chart for the determination of moisture in sunflower seed using a 3½ inch cell Model 919 was introduced. Although it has no official recognition, a correction factor for this chart was established for those who wish to use a 3 inch cell tester for varieties having a small seed size.

Grain Appeal Tribunal. A total of 337 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of cars officially inspected in the Western Division. The grades assigned by the Inspection Division were sustained in 312 cases. Approximately 81% of the samples reviewed by the Tribunal represented carlot shipments of wheat. They covered a wide range of grades in the red spring, amber durum and Alberta winter varieties. The total also included 51 samples of barley.

Grading Services to Producers. The number of "Subject to Inspector's Grade and Dockage" samples and other unofficial samples inspected was down by nearly 15% from the previous year due to the high quality of crops harvested and delivered into the elevator system in the crop year.

The Inspection Division handled 19 requests for review of samples representing grain delivered to primary elevators on a special bin basis and shipped to terminal elevators in carload lots.

Service to Other Organizations. The Economics and Statistics Division functioned as a statistical support agency for the Canadian Wheat Board supplying to that Board all major reports and publications compiled by the Division, particularly those related to country elevator operations and the positioning of grain stocks. This office and the Canadian Wheat Board also co-operated in the exchange of information for use by electronic data processing equipment.

The Division served as the prime source of grain handling statistics pertaining to the licensed elevator system for incorporation in a variety of statistical releases by Statistics Canada. In particular, this office supplied the Agricultural Division of Statistics Canada with the primary material for the joint annual publication, **Grain Trade of Canada**.

Special Acts Administration. Under the provisions of the Prairie Farm Assistance Act, during the 1970-71 crop year the Commission collected \$7,185,656, covering the 1 per cent levy on grain purchased by licensees under the Canada Grain Act. Levy collections to July 31, 1971 total \$214,564,043.

The Commission did not find it necessary to establish any maximum freight rates under the provisions of the Inland Water Freight Rates Act.

SECTION 4 — PERSONNEL ADMINISTRATION

Staffing. Under the provisions of the revised Canada Grain Act the new Canadian Grain Commission was appointed, effective April, 1971, consisting of Mr. H. D. Pound, Chief Commissioner; Mr. C. L. Shuttleworth, Assistant Chief Commissioner; and Mr. F. M. Hetland, Commissioner. Mr. R. G. McCullough succeeded Mr. A. Rendfleisch as Assistant Commissioner for Alberta in November, 1971. Other appointments to senior positions on the Commission's staff included Mr. D. Figurski, Assistant General Manager, Canadian Government Elevators; Mr. A. Schaen, Deputy Assistant Chief Grain Inspector; Mr. S. Rudyk, Grain Inspector in Charge at Thunder Bay, succeeding Mr. A. G. Morgan; and Mr. H. D. Swalwell, Assistant Director, Economics and Statistics Division. Mr. J. A. Morrison, Acting Chief Grain Weighman, retired from the Commission's staff at the end of 1971. The Commission deferred the appointment of a Chief Grain Weighman to fill this vacancy on the staff until a special study of grain weighing services and procedures is completed.

At December 31, 1971, total staff, exclusive of the Canadian Government Elevators, was 876 compared with 832 at the end of 1970. The increase resulted from the larger grain movement which developed during the year and the introduction of protein as a factor in the grading of red spring wheat. The staff of the Canadian Government Elevators totalled 178 at December 31, 1971, a decrease of 8 from the previous year.

When the new Canada Grain Act came into force on April 1, 1971, action was taken to bring the employees of the Canadian Government Elevators under the provisions of the Public Service Employment Act.

Collective Agreements. During the year 16 collective agreements and two major arbitral awards were negotiated. Classification conversion of positions in the Chemistry Group was completed.

Staff Training and Development. The level of development, education and training was well maintained in all Divisions. The Inspection Division continued a well-directed plan of studies and examinations for grain inspectors at their various levels. Senior officers of the Weighing Division conducted training sessions for members of the operating staff to provide instruction on such matters as weighing procedures, operation of automatic scales, and safety devices and precautions.

During the year, a number of employees took educational courses related to their duties and costs were partly subsidized from public funds. One employee received a Suggestion Award and 25 employees received certificates in recognition of 25 years service in the Public Service of Canada.

APPENDIX A

Grain Statistics and Quality

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A-1—Supply and Disposition of Canadian Grain, Crop Year 1970-71

	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed	Total
SUPPLY							
	— thousands of bushels —						
Carry-over July 31, 1970	1,008,690	141,340	200,078	10,647	5,970	3,633	1,370,358
Production in 1970	331,519	367,850	415,704	22,427	48,932	72,200	1,258,632
Total Supply	1,340,209	509,190	615,782	33,074	54,902	75,833	2,628,990
DISPOSITION							
Exports *	435,062	13,116	179,595	8,917	22,487	46,802	705,979
Consumed in Canada	154,693	370,701	291,919	11,414	5,709	18,002	852,438
Total Disposition	589,755	383,817	471,514	20,331	28,196	64,804	1,558,417
CARRY OVER (JULY 31, 1971)							
On farms (estimated)	411,120	91,150	61,650	5,200	10,600	200	579,920
In country, private, terminal and mill elevators	258,272	30,949	68,220	6,098	13,661	8,446	385,646
In store and afloat at eastern elevators	53,576	2,258	7,976	312	1,303	56	65,481
In eastern flour mills	2,642	202	—	—	—	—	2,844
In transit by rail — eastern and western divisions	24,844	814	6,422	991	1,142	2,327	36,540
In store and in transit to the United States	—	—	—	142	—	—	142
Total Carry-over July 31, 1971 ..	750,454	125,373	144,268	12,743	26,706	11,029	1,070,573

* Includes 24,676,153 bushels of wheat flour, 945,738 bushels of bagged seed wheat, 22,054 bushels of rolled oats and oatmeal, 7,339,900 bushels of barley malt and 1,292,803 bushels of flaxseed in linseed oil form.

A-2—Licences in Force and Storage Capacity, August 1, 1971 and 1970

Type of licence	Licences in force		Licensed storage capacity	
	August 1 1971	1970	August 1 1971	1970
Primary elevator	4,849	4,972	393,993,650	398,832,250
Terminal and process elevator	59	58	169,418,710	169,353,710
Transfer elevator	29	30	130,486,300	131,827,300
Grain dealer	19	32	*	*
Totals	4,956	5,092	693,898,660	700,013,260

* These licences do not cover grain storage facilities.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1970-71

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Manitoba Northern	15,593	7.5	—
2 Manitoba Northern	89,123	42.7	—
3 Manitoba Northern	47,480	22.8	—
4 Manitoba Northern	28,624	13.7	—
Tough 1 to 4 Manitoba Northern	10,370	5.0	—
4 Special	—	*	—
No. 5	10,747	5.2	—
No. 6	1,636	.8	—
Feed	174	.1	—
Garnet	42	*	—
Tough Others	3,043	1.5	—
Damp	38	*	—
Smutty	4	*	—
Rejected	1,345	.6	—
Others red spring	134	.1	—
Total red spring wheat	208,353	100.0	87.0
1 Canada Western Amber Durum	1,286	4.5	—
2 Canada Western Amber Durum	12,283	43.3	—
3 Canada Western Amber Durum	6,873	24.2	—
Extra 4 Canada Western Amber Durum	4,693	16.6	—
4 Canada Western Amber Durum	1,974	7.0	—
5 Canada Western Amber Durum	108	.4	—
6 Canada Western Amber Durum	2	*	—
Tough Durum	766	2.7	—
Others Durum	375	1.3	—
Total amber durum wheat	28,360	100.0	11.8
Total soft white spring	641	—	.3
Total mixed wheat	231	—	.1
Total Alberta winter wheat	1,832	—	.8
Total all wheats	239,417	—	100.0

* Less than 0.05%.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1970-71 (Continued)

Grade	Carlots	Percentage
OATS		
1 Canada Western	—	—
2 Canada Western	72	.5
Extra 3 Canada Western	659	4.8
3 Canada Western	2,342	17.2
Extra 1 Feed	1,777	13.0
1 Feed	7,675	56.2
2 Feed	648	4.7
3 Feed	139	1.0
Mixed Feed	125	1.0
Tough	55	.4
Damp	—	—
Rejected	73	.5
Others	93	.7
Total oats	13,658	100.0
BARLEY		
1 Canada Western Six-Row	—	—
2 Canada Western Six-Row	287	.3
3 Canada Western Six-Row	10,740	11.2
1 Canada Western Two-Row	4	*
2 Canada Western Two-Row	708	.7
3 Canada Western Two-Row	5,274	5.4
1 Feed	63,648	66.2
2 Feed	11,184	12.0
3 Feed	991	1.0
Tough	3,009	3.1
Damp	22	*
Rejected	135	.1
Others	81	*
Total barley	96,083	100.0

* Less than 0.05%.

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1970-71
(Continued)**

Grade	Carlots	Percentage
RYE		
1 Canada Western	8	.2
2 Canada Western	2,301	47.1
3 Canada Western	2,240	45.8
4 Canada Western	106	2.2
Ergoty	100	2.0
Tough	132	2.7
Damp	—	—
Rejected	1	*
Others	2	*
Total rye	4,890	100.0
FLAXSEED		
1 Canada Western	15,685	95.4
2 Canada Western	266	1.6
3 Canada Western	146	.8
4 Canada Western	10	.1
Tough	260	1.6
Damp	25	.2
Rejected	29	.2
Others	18	.1
Total flaxseed	16,439	100.0
RAPESEED		
1 Canada	25,847	97.3
2 Canada	203	.8
3 Canada	109	.4
Others	417	1.5
Total rapeseed	26,576	100.0

* Less than 0.05%.

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1970-71
(Concluded)**

Grade	Carlots	Percentage
OTHER GRAINS		
Corn	24	—
Sunflower seed	142	—
Mixed grain	189	—
Screenings	176	—
Buckwheat	814	—
Soybeans	—	—
Peas	221	—
Sample grain	54	—
Safflower seed	202	—
Mustard seed	771	—
Condemned grain	28	—
	2,621	—
Grand total	399,684	—

**A-4—Samples of Western Grain “Subject to Grade and Dockage” and
Other Unofficial Samples Inspected, Crop Year 1970-71,
Compared with Crop Year 1969-70**

Point	1970-71	1969-70
	Number of samples	
Winnipeg	13,923	14,817
Calgary	6,424	13,248
Edmonton	1,703	1,674
Moose Jaw	101	60
Saskatoon	1,164	1,238
Lethbridge	8,292	6,079
Totals	31,607	37,116

A-5—Inward Carlot Re-Inspections of Western Grain, Crop Year 1970-71

Point	Inspected	Re-inspected	Un-changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	239,425	19,328	17,645	1,567	46	7	63
Winnipeg	6,647	804	704	76	22	—	2
Churchill	12,743	1,056	905	135	15	—	1
Moose Jaw	165	10	10	—	—	—	—
Saskatoon	4,175	216	198	13	5	—	—
Calgary	3,422	187	152	35	—	—	—
Edmonton	1,455	178	163	5	1	—	9
Medicine Hat	1,343	57	43	11	3	—	—
Lethbridge	334	122	121	1	—	—	—
Prince Rupert	6,364	251	243	8	—	—	—
Vancouver	123,611	12,303	10,956	1,267	28	7	45
Totals	399,684	34,512	31,140	3,118	120	14	120
Percentage of total carlots	100.0	8.6	7.8	.8	•	•	•

* Less than 0.05%.

A-6—Outward Carlot Inspections of Western Grain at Terminal and Mill Elevators, Crop Year 1970-71

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	132	1,925	198	198	1,433
Oats	335	2,474	23	27	7
Barley	217	2,482	635	34	78
Flaxseed	1	448	12	33	7
Rye	2	271	4	2	1
Mixed grain	7	23	1	5	—
Corn	—	—	—	—	—
Buckwheat	3	—	1	—	3
Peas	39	—	—	—	—
Screenings	191	6,745	18	120	28
Rapeseed	—	114	146	799	1
Sample feed grain	8	—	29	—	—
Mustard seed	1	9	10	9	121
Sample grain	26	171	12	—	6
Totals	962	14,662	1,089	1,227	1,685

**A-6—Outward Carlot Inspections of Western Grain at Terminal and
Mill Elevators, Crop Year 1970-71
(Concluded)**

	Saskatoon	Lethbridge	Medicine Hat	Vancouver, Victoria and Prince Rupert	Churchill
Wheat	1,591	53	66	78	—
Oats	204	—	—	220	—
Barley	93	2	9	28	—
Flaxseed	1	2	2	2	—
Rye	3	1	—	15	—
Mixed grain	2	—	—	46	—
Corn	—	—	—	—	—
Buckwheat	—	—	—	1	—
Peas	—	—	—	—	—
Screenings	294	—	1	1,685	—
Rapeseed	1,146	—	—	1	—
Sample feed grain	—	—	—	6	—
Mustard seed	26	65	—	3	—
Sample grain	4	—	—	4	—
Totals	3,364	123	78	2,089	—

A-7—Carlot Inspections of Eastern Grain, Crop Year 1970-71

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
1 Canada Eastern White Winter	—	—	350	350
2 Canada Eastern White Winter	—	52	1,436	1,488
3 Canada Eastern White Winter	—	—	229	229
4 Canada Eastern Special White Winter	—	—	21	21
4 Canada Eastern White Winter	—	—	9	9
5 Canada Eastern White Winter	—	—	10	10
1 Canada Eastern Mixed Winter	—	—	10	10
2 Canada Eastern Mixed Winter	—	—	35	35
Tough	—	9	341	350
Damp	—	—	2	2
Sample	—	—	9	9
Totals	—	61	2,452	2,513

A-7—Carlot Inspections of Eastern Grain, Crop Year 1970-71
(Continued)

Grade	Montreal	Toronto	Chatham	Total
BARLEY				
2 Canada Eastern Six Row	—	—	2	2
3 Canada Eastern Six Row	—	—	195	195
3 Canada Eastern Two Row	—	—	2	2
4 Canada Eastern	—	—	15	15
Tough	—	—	6	6
Totals	—	—	220	220
RYE				
2 Canada Eastern	—	—	4	4
3 Canada Eastern	—	—	4	4
4 Canada Eastern	—	—	4	4
Tough	—	—	13	13
Damp	—	—	1	1
Totals	—	—	26	26
BUCKWHEAT				
Tough	—	—	4	4
Totals	—	—	4	4
CORN				
Extra Dry 1 Canada Eastern Yellow	78	—	879	957
1 Canada Eastern Yellow	25	—	939	964
Extra Dry 2 Canada Eastern Yellow	28	—	592	620
2 Canada Eastern Yellow	6	—	583	589
Extra Dry 3 Canada Eastern Yellow	—	—	136	136
3 Canada Eastern Yellow	—	—	86	86
Extra Dry 4 Canada Eastern Yellow	—	—	23	23
4 Canada Eastern Yellow	—	—	13	13
Extra Dry 5 Canada Eastern Yellow	—	1	7	8
5 Canada Eastern Yellow	5	—	3	8
Tough	1	—	43	44
Damp	—	—	14	14
Moist	—	—	3	3
Sample	2	—	1	3
Totals	145	1	3,322	3,468

**A-7—Carlot Inspections of Eastern Grain, Crop Year 1970-71
(Concluded)**

Grade	Montreal	Toronto	Chatham	Total
BEANS				
Extra 1 Canada Eastern Pea	—	—	6	6
1 Canada Eastern Pea	—	—	72	72
2 Canada Eastern Pea	—	—	2	2
4 Canada Eastern Pea	—	—	1	1
1 Canada Eastern Light Red Kidney	—	—	6	6
Totals	—	—	87	87
SOYBEANS				
1 Canada Yellow	—	1	516	517
2 Canada Yellow	—	5	568	573
3 Canada Yellow	—	1	59	60
4 Canada Yellow	—	—	2	2
Tough	—	3	210	213
Damp	—	2	74	76
Moist	—	—	50	50
Wet	—	—	3	3
Sample	—	—	2	2
Totals	—	12	1,484	1,496
Totals, all grains	145	74	7,595	7,814

**A-8—Inspections of Eastern Grain in Cargoes, Bins, Trucks or
Warehouses, Crop Year 1970-71**

Grain	Montreal	Toronto	Chatham	Total
— bushels —				
Wheat	421,613	—	6,883,460	7,305,073
Corn	—	3,000	6,605,327	6,608,327
Beans	—	—	1,501,750	1,501,750
Soybeans	93,114	922	882,694	976,730
Buckwheat	20,313	—	—	20,313
Totals	535,040	3,922	15,873,231	16,412,193

**A-9—Inward and Export Cargoes Sampled and Inspected,
Crop Year 1970-71**

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Baie Comeau	Port Cartier	Total
Eastern grain				— bushels —				
Inward	715,678	—	—	—	—	—	—	715,678
Export	3,118,317	—	—	35,063	55,816	390,980	958,649	4,558,825
Western grain								
Inward	7,777,699	—	—	—	—	4,095,448	—	11,873,147
Export	93,339,931	34,781,154	23,451,906	36,015,893	29,980,197	57,534,271	55,259,585	330,362,937
Totals	104,951,625	34,781,154	23,451,906	36,050,956	30,036,013	62,020,699	56,218,234	347,510,587

A-10—Grain Sampled but not Inspected, Crop Year 1970-71

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern grain							
Carlots	347	—	—	—	—	—	347
Inward cargoes (bu.)	742,845	—	—	—	—	—	742,845
Outward cargoes (bu.)	—	—	—	—	—	—	—
Bin lots (bu.)	616,764	—	—	—	—	—	616,764
Western grain							
Carlots	6	—	—	—	—	—	6
Inward cargoes (bu.)	6,504,047	—	18,278	—	—	—	6,522,325
Outward cargoes (bu.)	—	—	—	—	—	—	—
Bin lots (bu.)	47,859	—	—	—	—	—	47,859
U.S.A. grain							
Carlots	4	—	—	—	—	—	4
Inward cargoes (bu.)	3,792,033	—	883,081	—	—	1,838,883	6,513,997
Outward cargoes (bu.)	3,635,008	—	13,533,216	—	36,095,344	19,712,554	72,976,122
Bin lots (bu.)	402,738	—	—	—	—	145,923	548,661
Totals—cars	357	—	—	—	—	—	357
 bushels	15,741,294	—	14,434,575	—	36,095,344	21,697,360	87,968,573

A-11—Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1970-71

Point	Wheat	Oats	Barley	Rye	Flaxseed
RECEIPTS					
— bushels —					
Thunder Bay	264,620,052	36,754,873	152,607,291	4,219,828	19,780,266
Vancouver	145,351,428	75,183	46,155,945	5,427,295	9,205,409
Victoria	6,063,649	423	3,215	—	99
Prince Rupert	11,805,092	—	—	—	—
Churchill	23,296,926	—	564,370	—	—
Calgary	287,236	5,814	1,529,169	10,177	26,533
Edmonton	294,005	187	49,569	5,479	71,792
Lethbridge	41,010	—	11,686	4,377	6,542
Moose Jaw	349,943	10,203	225,101	2,099	17,444
Saskatoon	21,952	—	18,687	—	1,731
Total Receipts	452,131,293	36,846,683	201,165,033	9,669,255	29,109,816
SHIPMENTS					
— bushels —					
Thunder Bay	286,341,004	34,430,681	156,997,393	4,347,266	15,400,877
Vancouver	149,351,156	1,296,250	47,706,073	5,174,074	8,451,729
Victoria	6,201,105	130,369	13,791	—	—
Prince Rupert	11,994,976	141,208	—	—	—
Churchill	23,551,206	320,721	2,141	—	—
Calgary	494,005	8,507	1,664,110	10,033	26,469
Edmonton	506,928	85,463	81,549	5,479	71,792
Lethbridge	124,791	7,132	11,686	4,377	6,542
Moose Jaw	2,806,585	17,262	225,101	2,099	17,444
Saskatoon	3,072,013	53,824	18,513	—	1,731
Total Shipments	484,443,769	36,491,417	206,720,357	9,543,328	23,976,584

**A-11—Quantities of Grain Inspected and Weighed at Terminal
Elevators, Crop Year 1970-71
(Concluded)**

Point	Peas	Buckwheat	Mustard Seed	Rapeseed	Miscellaneous
RECEIPTS					
			— bushels —		
Thunder Bay	222,324	168,025	958,936	16,168,145	213,979
Vancouver	—	1,593,338	486,420	28,656,548	457,443
Victoria	—	—	—	2,782,091	1,009
Prince Rupert	—	—	—	1,971	284,543
Churchill	—	—	—	—	—
Calgary	—	1,784	95	330,680	93,198
Edmonton	—	—	—	1,766,429	848
Lethbridge	—	—	76,600	2,482	3,682
Moose Jaw	—	7,735	245,382	4,600	2,629
Saskatoon	—	—	204,886	227,559	277,028
Total Receipts	222,324	1,770,882	1,972,319	49,940,505	1,334,359
SHIPMENTS					
			— bushels —		
Thunder Bay	192,694	168,454	1,026,393	14,229,788	229,757
Vancouver	—	1,501,098	499,767	29,216,291	442,545
Victoria	—	—	—	2,771,914	—
Prince Rupert	—	—	—	1,971	289,510
Churchill	—	—	—	—	—
Calgary	—	1,784	13,865	332,023	77,750
Edmonton	—	—	13,729	1,782,630	—
Lethbridge	—	—	83,074	2,482	3,625
Moose Jaw	—	7,735	230,349	4,600	11,838
Saskatoon	—	—	62,214	220,797	67,058
Total Shipments	192,694	1,679,071	1,929,391	48,562,496	1,122,083

**A-12—Carlots Weighed, Leaking or with Defective Seals, in the
Western Division
Crop Years 1969-70 and 1970-71**

	1970-71	Number 1969-70	Percentage 1970-71	of total 1969-70
Cars weighed in	402,499	320,748	100.0	100.0
Inward cars leaking	51,963	45,858	12.9	14.3
Inward cars with missing or defective seals	18,247	10,637	4.5	3.3
Cars weighed out	21,224	17,502	—	—

**A-13—Average Reported Outturn Shortage on Vessel Shipments of Grain
from Thunder Bay to Licensed Eastern Elevators
Crop Year 1970-71**

Grain	Bushels Shipped	Shortage in pounds per 1000 bushels 1970-71	1969-70
Wheat	235,035,960	35.54	37.19
Durum Wheat	44,259,269	42.19	37.22
Oats	16,848,600	24.41	24.64
Barley	132,345,186	41.44	35.71
Ryé	1,657,342	50.78	39.60
Flaxseed	9,669,860	32.99	29.35
Rapeseed	4,757,476	—	—
Screenings (in tons)	87,202	1.77	2.65
		per ton	per ton

A-14—Tough and Damp Grain Dried at Terminal Elevators, Crop Year 1970-71

	Artificial Drying			Natural Drying	Total
	Tough	Damp	Tough and Damp		
— bushels —					
Thunder Bay					
Wheat	9,778,360	71,351	9,849,711	5,435,357	15,285,068
Durum	226,903	38,281	265,184	888,068	1,153,252
Oats	13,463	2,380	15,843	64,550	80,393
Barley	12,028	40,863	52,891	3,929,820	3,982,711
Rye	40,986	—	40,986	116,997	157,983
Flaxseed	223,180	33,836	257,016	133,991	391,007
Mixed Grain *	206	77	283	—	283
Buckwheat	—	—	—	—	—
Rapeseed	3,705	—	3,705	7,922	11,627
Mustard Seed	—	—	—	—	—
Totals	10,298,831	186,788	10,485,619	10,576,705	21,062,324
Pacific Coast					
Wheat	4,638,967	16,368	4,655,335	3,982,449	8,637,784
Durum	—	—	—	92,548	92,548
Oats	—	—	—	—	—
Barley	440,000	5,699	445,699	1,434,685	1,880,384
Rye	3,347	—	3,347	73,556	76,903
Flaxseed	1,122	475	1,597	14,529	16,126
Mixed Grain *	—	—	—	—	—
Buckwheat	7,000	1,922	8,922	2,039	10,961
Rapeseed	—	811	811	13,370	14,181
Mustard Seed	—	—	—	—	—
Totals	5,090,436	25,275	5,115,711	5,613,176	10,728,887
Interiors					
Wheat	—	—	—	—	—
Durum	—	—	—	—	—
Oats	—	—	—	—	—
Barley	—	—	—	4,862	4,862
Rye	—	—	—	—	—
Flaxseed	—	—	—	—	—
Mixed Grain *	—	—	—	—	—
Rapeseed	—	—	—	—	—
Mustard Seed	—	—	—	1,341	1,341
Sunflower Seed	—	2,629	2,629	—	2,629
Totals	—	2,629	2,629	6,203	8,832
Churchill					
Wheat	—	—	—	280,488	280,488
Totals, all positions	15,389,267	214,692	15,603,959	16,476,572	32,080,531

* In bushels of 50 pounds

A-15—Quality Data for Grades of Hard Red Spring Wheat Marketed Crop Year 1970-71

	1 Nor.	2 Nor.	3 Nor.	4 Nor.	No. 5	No. 6
Test weight, Avery, lb./bu.	68.3	67.8	66.7	65.2	63.1	60.8
1000 kernel weight, g	29.4	29.8	29.8	30.6	29.6	29.7
Wheat protein content, %1	13.9	13.8	13.8	13.7	13.4	13.3
Flour protein content, %2	13.0	13.2	12.8	12.7	12.2	11.6
Flour yield, %	75.1	75.0	75.0	74.3	72.3	67.3
Flour ash content, %	0.45	0.47	0.48	0.49	0.53	0.57
Flour diastatic activity, mg	175	179	191	239	299	472
Baking absorption, %	62.0	63.0	62.0	62.0	61.0	60.0
Loaf volume, cc	850	855	840	840	765	550

1 13.5% moisture basis.

2 14.0% moisture basis.

A-16—Carlot Inspections Appealed, Crop Year 1970-71

Item	Carlots	Percentage
Left as graded	312	92.6
Grades raised	24	7.1
Grades lowered	1	.3
Totals	337	100.0

A-17—Prairie Farm Assistance Act Collections, Crop Year 1970-71

Province	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed	Total
	\$	\$	\$	\$	\$	\$	\$
Manitoba	268,195.12	39,549.28	115,577.99	10,316.26	99,374.54	57,234.13	590,247.32
Saskatchewan	3,097,264.30	105,844.45	600,103.70	51,601.93	315,540.27	539,280.45	4,709,635.10
*Alberta	845,752.18	53,493.77	563,254.96	20,089.47	110,520.01	292,662.74	1,885,773.13
Totals	4,211,211.60	198,887.50	1,278,936.65	82,007.66	525,434.82	889,177.32	7,185,655.55

Penalties on late filing of returns

Total collections Crop Year 1970-71

7,185,655.55

* Includes Peace River area in B.C.

NOTE: Does not include levy deductions from Canadian Wheat Board final payments on the 1970-71 Pool accounts for Wheat, Oats and Barley.

A-18—Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1971

Port of Discharge	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed
— cents per bushel —						
Georgian Bay Ports, Goderich and Sarnia	4.621	5.053	5.303	6.0	—	—
Port Colborne	5.70	5.75	5.90	—	—	—
Toronto	7.038	6.434	6.908	7.0	7.607	—
Kingston	6.0	—	—	—	—	—
Prescott	6.734	6.5	7.5	—	—	—
Montreal	8.027	6.081	7.25	8.0	8.594	8.5
Sorel	8.0	6.25	7.276	—	—	—
Three Rivers	8.10	6.0	7.25	8.0	—	—
Quebec	8.029	6.134	7.244	8.104	8.983	9.086
Baie Comeau	8.0	—	7.289	7.75	8.549	8.0
Port Cartier	8.11	—	7.25	—	8.25	—
Halifax	15.074	12.125	14.65	—	—	—
Other Maritimes	23.025	28.0	18.287	—	—	—
Buffalo	—	—	10.0	—	—	—
Duluth-Superior	—	—	7.5	—	—	—
Manitowoc	—	—	9.027	—	—	—
Milwaukee	—	—	8.44	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

In connection with the coming into force of the new Canada Grain Act on April 1, 1971, the Commission made a revised set of Canada Grain Regulations to become effective on the same date.

Schedules B and K to the Regulations were amended, effective August 1, 1971, to reduce the free storage period for grain handled through licensed primary elevators from fifteen days to ten days.

Section 58 of the Regulations was amended on December 21, 1971 to make provision for alternative protein levels in connection with the segregation of red spring wheat at terminal elevators.

Western Grain Standards Committee as at December 31, 1971

H. D. Pound	Chief Commissioner	} Canadian Grain Commission
M. M. Ainslie	Chief Grain Inspector	
Dr. G. N. Irvine	Chief Chemist	
J. L. A. Doray	Chairman, Grain Appeal Tribunal	
Dr. J. W. Morrison	} representing the Canada Department of Agriculture	
M. H. Rowland		
C. W. Gibbings	representing the Canadian Wheat Board	
N. H. McClure	} representing processors of grain	
W. W. Sisler		
G. E. Gould	} representing exporters of grain	
R. K. Lester		
John I. Miller	} representing producers of western grain	
R. E. Hadland		
Hubert N. Anderson		
H. R. Patching		
Elmer Kure		
Gordon South		
Devone R. Clark		
Avery K. Sahl		
Frank Dietz		
D. E. Campbell		
Wm. A. Ronald		
A. Bos		
H. K. Moen	additional	

Eastern Grain Standards Committee as at December 31, 1971

H. D. Pound	Chief Commissioner	} Canadian Grain Commission
M. M. Ainslie	Chief Grain Inspector	
Dr. G. N. Irvine	Chief Chemist	
Dr. J. W. Morrison	representing the Canada Department of Agriculture	
C. F. Bowker	} representing processors and exporters of grain	
F. J. Reid		
E. Cordeau		
M. Pardo		
M. R. McDougall	} representing producers of eastern grain	
Clarence Wilson		
Gus Sonneveld		
Kenneth Patterson		
Fernand Beaudet	} additional	
E. M. Jones		
G. C. Nichols		

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Canadian Grain Commission Organization and Functions</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible</i> <i>Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts</i> <i>at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Wheat. Crop Bulletin</i>	Annually
<i>Canadian Barley. Crop Bulletin</i>	Annually
<i>Canadian Flax and Rapeseed. Crop Bulletin</i>	Annually
<i>Canadian Wheat Cargoes. Bulletin</i>	Quarterly
<i>Canadian Durum Cargoes. Bulletin</i>	Quarterly
<i>Map of Western Canada showing the protein</i> <i>content of hard red spring wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Varietal Identification of Barley, Wheat and</i> <i>Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain</i> <i>Through a Primary Elevator</i>	
<i>The Farmer and the Primary Elevator</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1971 Annual Report.

APPENDIX D

Revenue and Expenditure

Earned revenue and net expenditure of the Commission, including the Canadian Government Elevators, for the fiscal year 1970-71 compared with 1969-70 were as follows:

	1970-71	1969-70
Revenue	\$ 8,798,363	\$7,254,996
Expenditure	10,718,372	9,587,468

Further information is given in the following tables.

**D-1—Earned Revenue and Net Expenditure, by Points and Division,
Fiscal Year ended March 31, 1971**

	Executive and Admini- stration	Inspection	Weighing	Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
				— dollars —			
Winnipeg	1,089	81,815	36,320	184,941	—	2,707,246	3,011,411
Churchill	—	111,122	56,881	—	—	—	168,003
Saskatoon	—	30,099	36,566	—	—	—	66,665
Moose Jaw	—	7,088	3,064	—	—	—	10,152
Medicine Hat	—	3,390	14,040	—	—	—	17,430
Lethbridge	—	14,003	452	—	—	—	14,455
Calgary	—	24,154	32,198	—	—	—	56,352
Edmonton	—	11,705	4,113	—	—	—	15,818
Vancouver	—	1,085,058	555,133	74,459	—	—	1,714,650
Victoria	—	40,045	18,838	—	—	—	58,883
Prince Rupert	—	59,290	29,572	—	—	—	88,862
Thunder Bay	—	2,227,248	1,126,858	—	—	—	3,354,106
Toronto	—	11,377	—	—	—	—	11,377
Chatham	—	103,123	—	—	—	—	103,123
Montreal	—	31,694	—	27,721	—	—	59,415
Baie Comeau	—	18,234	14,752	—	—	—	32,986
Port Cartier	—	5,641	9,034	—	—	—	14,675
Totals	1,089	3,865,086	1,937,821	287,121	—	2,707,246	8,798,363
EXPENDITURE							
				— dollars —			
Winnipeg	356,088	850,599	183,861	426,075	927,791	2,478,397	5,222,811
Churchill	—	11,454	9,887	—	—	—	21,341
Saskatoon	24,376	79,280	49,876	—	—	—	153,532
Moose Jaw	—	10,782	6,375	—	—	—	17,157
Regina	25,484	—	—	—	—	—	25,484
Medicine Hat	—	—	17,433	—	—	—	17,433
Lethbridge	—	23,659	—	—	—	—	23,659
Calgary	—	167,374	72,000	—	—	—	239,374
Edmonton	27,366	44,284	—	—	—	—	71,650
Vancouver	—	685,855	535,835	113,679	—	—	1,335,369
Victoria	—	39,658	28,376	—	—	—	68,034
Prince Rupert	—	37,660	31,305	—	—	—	68,965
Thunder Bay	—	1,507,754	1,180,608	137,994	—	—	2,826,356
Toronto	—	18,118	—	—	—	—	18,118
Chatham	—	107,739	—	—	—	—	107,739
Montreal	—	372,041	15,986	29,425	—	—	417,452
Baie Comeau	—	34,301	16,138	—	—	—	50,439
Port Cartier	—	33,459	—	—	—	—	33,459
Totals	433,314	4,024,017	2,147,680	707,173	927,791	2,478,397	10,718,372

Note: Revenue and Expenditures for all Government Elevators shown opposite Winnipeg.

**D-2—Summary of Operations by Divisions, Fiscal Year Ended
March 31, 1971**

	Executive and Admini- stration	Inspection	Weighing	Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
	— dollars —						
Fees	—	3,813,741	1,915,458	286,820	—	—	6,016,019
Overtime	—	32,724	21,829	—	—	—	54,553
Express Charges	—	5,233	—	—	—	—	5,233
Samples Sold	—	13,052	—	—	—	—	13,052
Refund of previous year's expenditures	—	336	534	301	—	—	1,171
Miscellaneous	1,089	—	—	—	—	—	1,089
Grain Handling Charges	—	—	—	—	—	2,707,246	2,707,246
Totals	1,089	3,865,086	1,937,821	287,121	—	2,707,246	8,798,363
EXPENDITURE							
	— dollars —						
Salaries	334,377	3,459,733	2,050,933	532,266	590,441	1,412,570	8,380,320
Rent of buildings	25,200	102,928	12,276	54,635	61,669	4,316	261,024
Travel	36,540	119,860	68,749	9,783	15,015	19,691	269,638
Purchase of equipment	—	109,805	28	—	103,793	231,780	445,406
Construction of buildings	—	27,291	—	—	—	—	27,291
Repairs and upkeep of buildings and works	—	9,276	—	67	—	84,537	93,880
Grants in lieu of taxes	—	—	—	—	—	392,013	392,013
Power (electrical)	—	—	—	—	—	138,928	138,928
Screenings	—	—	—	—	—	38,895	38,895
General Expense	22,375	152,405	10,579	88,930	138,706	152,009	565,004
Printing, Stationery and office equipment	14,822	42,719	5,115	21,492	18,167	3,658	105,973
Totals	433,314	4,024,017	2,147,680	707,173	927,791	2,478,397	10,718,372

APPENDIX E

CANADIAN GRAIN COMMISSION

Chief Commissioner H. D. Pound Commissioner C. L. Shuttleworth Commissioner F. M. Hetland		SECRETARY AND DIRECTOR OF ADMINISTRATION V. Martens 8 Financial Officer W. S. Rowland 6 Personnel Admin. G. E. Rogers 8		ASSISTANT COMMISSIONERS Winnipeg W. S. Frazer 2 Regina J. H. Davidson 2 Saskatoon R. H. Taylor 2 Edmonton R. G. McCullough 2	
GRAIN APPEAL TRIBUNAL Chairman J. L. A. Doray		WEIGHING - Acting Chief Weighman J. A. Morrison Winnipeg 16 Montreal 2 Thunder Bay 137 Saskatoon 5 Medicine Hat 2 Calgary 5 Vancouver 60 Victoria 3 Prince Rupert 5 Bale Comeau 1 Abbotsford 1 237		RESEARCH LAB. Director Dr. G. N. Irvine Winnipeg 65	
INSPECTION Chief Inspector M. M. Ainslie Winnipeg 73 Montreal 36 Chatham 8 Toronto 2 Thunder Bay 165 Saskatoon 10 Moose Jaw 2 Lethbridge 3 Calgary 20 Edmonton 6 Vancouver 77 Victoria 4 Prince Rupert 5 Bale Comeau 3 Port Cartier 3 417		ECONOMICS & STATISTICS - Director E. E. Baxter Winnipeg 38 Montreal 3 Thunder Bay 24 Vancouver 14 79		GOVT. ELEVATORS General Manager W. E. Turner Winnipeg 12 Saskatoon 27 Moose Jaw 21 Lethbridge 16 Calgary 29 Edmonton 32 Prince Rupert 41 178	

December 31, 1971.

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Government
Publications

[Canada]



Report of the

CANADIAN

GRAIN

COMMISSION

1972



CANADA DEPARTMENT OF AGRICULTURE

Minister	Deputy Minister
Hon. Eugene Whelan	S. B. Williams



Report of the

**CANADIAN
GRAIN
COMMISSION
1972**

CANADA DEPARTMENT OF AGRICULTURE

Minister
Hon. Eugene Whelan

Deputy Minister
S. B. Williams

Information Canada
Ottawa 1973
Cat. No. A91-1/1972

CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba,
February 28, 1973.

The Honorable Eugene Whelan, M.P.
Minister of Agriculture,
OTTAWA, Canada.

Sir:

We are pleased to submit the 1972 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act.

The report contains a review of the Commission's principal activities during the year, together with information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1971-72 crop year, and a review of the quality of 1972 grain crops.

Respectfully submitted,

H. D. Pound,
Chief Commissioner.

C. L. Shuttleworth,
Commissioner.

F. M. Hetland,
Commissioner.

R. S. Allen,
for Secretary.

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INTRODUCTION

The Canadian Grain Commission (renamed in 1971 from the Board of Grain Commissioners for Canada) is responsible for administering the Canada Grain Act and has general supervision over grain handling in Canada. It has the power to make regulations and orders that are consistent with the Act.

The Commission's operations are divided into six main functions. The Executive Offices deal with policy and general administrative matters, provide financial services to the divisions and include the offices of the Assistant Commissioners. The Inspection Division, which is the largest of the operational divisions, provides official inspection and grading of grain at various points across Canada, particularly grain received at and shipped from terminal elevators and grain loaded to vessels for export at transfer elevators. The Weighing Division is responsible for official weighing of grain at terminal and process elevators, weigh-overs of grain stocks in terminal and transfer elevators, and also inspection and certification of scales in terminal and transfer elevators. The Economics and Statistics Division collects, compiles and publishes basic statistics on the handling and storage of grain within the licensed elevator system. Other responsibilities include issuing of licences to elevator operators and grain dealers, supervision of bonding of licensees, and registration of elevator receipts issued by managers of terminal and transfer elevators. The Research Laboratory carries on a program of research related to the quality of cereal grains and oil seeds, conducts quality surveys of current crops and shipments, and tests new varieties in collaboration with plant breeders and the Commission's Inspection Division. The Canadian Government Elevators system, which is managed, operated and maintained by the Commission, is comprised of six terminal grain elevators located in Western Canada. The elevator at Prince Rupert, B.C., handles grain for loading directly to ocean vessels.

In addition, the Commission constitutes Grain Appeal Tribunals, and Western and Eastern Grain Standards Committees. It also has responsibility for setting maximum lake grain freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

The revised wheat grading system, which was introduced in 1971, was extended on January 1, 1972, by the commencement of the protein segregation at specific levels of No. 1 Canada Western Red Spring Wheat at Pacific Coast terminal elevators. A further stage in this program was reached on August 1, 1972, when protein segregation commenced for the new No. 2 C.W. Red Spring Wheat grade at Thunder Bay terminal elevators.

SECTION 1—GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1971-72

Record exports of the principal Canadian grains and oilseeds resulted in the attainment of several new handling records in 1971-72.

Total stocks of Canadian wheat, oats, barley, rye, flaxseed and rapeseed carried over into the 1971-72 crop year were estimated at 1,070.6 million bushels, representing a decrease of some 299.8 millions from the July 31, 1970, record carry-over. Farm held supplies accounted for 54% of total stocks. Record 1971 grain production of 1,633.9 million bushels included 529.6 millions of wheat, 363.5 of oats, 601.6 of barley, 21.9 of rye, 22.3 of flaxseed and 95.0 of rapeseed. The combined inward carry-over and 1971 production amounting to 2,704 million bushels was only slightly below the record supplies available in crop year 1969-70.

Canadian producers delivered a record total of 959.1 million bushels of the major grains and oilseeds to the licensed elevator system, some 164 millions more than in 1970-71. Barley (296.1 millions) and rapeseed (69.8 millions) deliveries established all-time highs. Only oats and flaxseed marketings failed to exceed the previous year's volume.

Export clearances of the six principal grains and oilseeds in bulk form totaled a record-breaking 791.6 million bushels. This represents an increase of 120 millions from the previous high of 1970-71, when 671.7 million bushels were cleared to overseas destinations and the United States. Export clearances of barley (224.3 millions) and flaxseed (25.7 millions) achieved new records for these grains. Bulk wheat exports of 478.1 million bushels exceeded the heavy shipments of the previous year as did shipments of rye (10.8 millions).

The 1971-72 commercial disappearance included 900.4 million bushels utilized in Canada for feed, seed, human food and industrial purposes. The total disposition to export and domestic outlets left a carry-over of 978.8 million bushels — a reduction of over 100 millions from the stocks at July 31, 1971.

Quality of Grain Marketed in 1971-72

Hard Red Spring Wheat. A two-stage conversion from the traditional Manitoba Northern grades to a series of new Canada Western grades for red spring wheat began in the 1971-72 crop year. The first phase was the introduction of the new grade No. 1 Canada Western Red Spring Wheat to replace the two grades No. 1 and No. 2 Manitoba Northern. Over 70% of carlot shipments received into terminal elevators qualified for the new No. 1 C.W. Red Spring protein segregated grade, indicating the very high visual quality characteristics of the 1971 production. Only 4.1% of country elevator shipments were

graded Tough and Damp, and the total of all off-grade lots was very low, making up only 4.6% of the primary movement. This grade was segregated on the basis of protein content on entry into terminal elevators in order to guarantee certain specific minimum levels of protein content in export shipments.

In general, the quality of the year's carlot movement of No. 1 Canada Western Red Spring Wheat was equal to that of the previous year's movement of No. 1 and No. 2 Manitoba Northern. Wheats entering the grades No. 3 and No. 4 Manitoba Northern in the 1971-72 crop year were higher in test weight per bushel but slightly lower in baking absorption and in bread loaf volume than the corresponding grades of the previous year's movement.

This segregation of No. 1 Canada Western Red Spring Wheat into a series of subgrades based on protein levels greatly improved the uniformity of stocks available for export shipments. Export shipments of the new No. 1 C.W. grade and of all other grades of wheat exported during the year were generally satisfactory in their quality characteristics.

Amber Durum Wheat. The durum wheat movement in the 1971-72 crop year increased by 30% over that of the previous year to 36,962 carlots. Visual quality was excellent with 42.3% of primary shipments grading No. 1 and No. 2 Canada Western. About 25.2% of the total movement graded No. 3 and 17.2% graded Extra No. 4. Only 1.5% of the movement graded Tough. Test weight for the grades Extra No. 4, No. 4 and No. 5 C.W. were lower this year than last. Pigment content of the semolina and spaghetti was significantly higher this year, reflecting the gradual increase in the amount of the new variety Hercules in the durum wheat movement. The only exception was the grade Extra No. 4 C.W. which is made up predominantly of the somewhat lower pigmented variety Pelissier.

A significant number of cargoes of amber durum wheat were shipped from the Pacific Coast again this year. These were generally higher in 1000-kernel weight and also slightly higher in semolina and spaghetti pigment content than Atlantic shipments. However, grade for grade, there was very little difference in the overall color of the spaghetti between Pacific and Atlantic exports of durum.

Barley. Barley production in Western Canada attained new production records for four successive years from 1968 through to 1971, reaching 570 million bushels in 1971. The volume of the barley movement in Western Canada also reached a new high in the 1971-72 crop year. Six-row and two-row barley qualifying for the Canada Western grades accounted for 20% of the barley movement, and barley grading No. 1 Feed amounted to almost 69% of the movement. The malting quality of the higher grades of the 1971-72 barley movement was good. The somewhat lower nitrogen content and smaller kernel size characteristics of the 1971 crop barley, although apparent in the second

half of the year's movement, were not really serious. There has been a steady increase in domestic and export markets for two-row malting barley, and over 12 million bushels were shipped to the United States during the year.

Oats. The above-average, overall quality of oats marketed is emphasized by the 32.5% of primary shipments grading No. 3 C.W. or higher, compared with only 20% in these milling grades in the previous year. Although production, estimated at 377.2 million bushels, was some 3% above 1970's, the crop-year movement was lower by 2,127 carlots.

Rye. At 24.8 million bushels, the 1971 rye crop was about 10% above 1970 production. Harvest conditions were excellent and general quality above average. A moderate discoloration from smudge and the presence of ergot at about normal levels were the two main degrading factors. Movement to terminals of 5,710 carlots was higher than in either of the previous 2 years.

Flaxseed. Flax marketings in the 1971-72 crop year were 13,855 carlots, a 13% lower rail movement than in the 1970-71 crop year. As usual, most of the flax (96.6%) was of top grade. Oil content for all grades averaged 42.2%, down 0.2 from the level of the previous crop year. The protein content of the oil-free meal was significantly higher this year, 41.4% (results reported on a dry-matter basis).

Rapeseed. The volume of rapeseed marketed in the 1971-72 crop year, 22,837 carlots, was about 14% lower than the record high of the previous year. Total production was estimated at 98.5 million bushels, about 26 millions higher than in 1970. Over 97% of the carlots graded No. 1 Canada Rapeseed. Oil content averaged 43.9% (moisture-free or dry basis), 0.7 units lower than for the previous crop year. Protein content of the residual oil-free meal was also slightly lower this year at 40.3%.

Domestic Mustard Seed. Production was up by some 25% in 1971 but the primary movement of domestic mustard seed was close to the same level as in the previous year, with 782 carlots inspected. The bulk of these moved directly for export and the general level of basic quality was good, with immaturity and inseparable weed seeds the main degrading factors.

Domestic Buckwheat. Estimated production in 1971 of 2.1 million bushels was about 25% below 1970's, but yields were slightly better on a reduced acreage. Grades and overall quality were slightly better with immaturity having an effect on color and test weight. The average of all shipments was the No. 3 C.W. grade, which is the desirable quality level for export contracts.

Peas. The acreage sown to dry peas in 1971 was slightly lower than in 1970 but a record average yield of 24.2 bushels per acre produced a 12% larger volume at 1.833 million bushels. Soil tag and immaturity were the main faults and the predominant grade was No. 3 Canada Western Century variety.

Canada Eastern Grains. Inspections of white winter wheat at a total of 1,026 carlots were nearly 60% lower than in the previous crop year; quality and yield were at normal levels, with 64% grading straight No. 2 C.E. or better; 26% of the wheat inspected was either tough or damp. A mean protein content of 10.7% was reported by the research laboratory based upon a survey of 378 samples representing all production areas in southern Ontario. Very little oats, barley or rye was inspected in rail cars, because of increased use of trucks in domestic marketing of eastern grains. These crops were slightly above average in quality and no serious handling problems were experienced. Corn inspections at 3,002 carlots were down 13% from 1970-71 but crop quality was high, with 90% of shipments grading No. 2 C.E. Yellow and less than 3% being off grade on account of high moisture. Of the soybeans inspected, nearly 50% were tough, damp, or moist but basic quality was quite high with most shipments grading No. 1 or No. 2 Canada. The bulk of pea beans were harvested in 1971 in good weather which yielded a good bright sample. Warehouse inspections of beans were over 90% of No. 1 C.E. grade and of a total of 86 carlots inspected only 3 were No. 2 C.E. or lower.

Growing Conditions, Grades and Quality, 1972 Crop

Conditions at seeding time, during the growing season and through the harvest period were quite variable, perhaps even adverse, for large portions of the Western Canadian prairies in 1972. Prolonged cool weather delayed seeding in many areas, and generally lower than normal temperatures until about mid-July markedly delayed crop development. Widespread frost near mid-September had a noticeable effect on later-maturing crops. Unseasonably early snow in much of Alberta covered large quantities of grain in the swath.

Early harvested grains were of very high quality, but late harvest material showed the effects of adverse weather conditions. Barley particularly showed a considerable amount of weather staining, and there was a higher than normal incidence of tough and damp grains and oilseeds.

Red Spring Wheat. Production of red spring wheat in Western Canada in 1972 was estimated at 439.5 million bushels. The carry-over of spring wheat from previous crops at July 31, 1972, was estimated to be 521.5 million bushels. About 39% of the new-crop wheat will qualify for the grade No. 1 C.W. Red Spring Wheat, about 36% will qualify for the new grade No. 2 C.W. Red Spring Wheat, and about 25% will enter No. 3 C.W. Red Spring or a lower grade.

The protein content of the 1972 red spring wheat crop averaged 13.0%, significantly lower than the average value of 13.6% for all spring wheat crops in the 20-year period 1952-1971. New-crop wheat from Saskatchewan averaged 13.1%, significantly higher than that from Alberta (12.7%) and Manitoba (12.6%).

The new system of grading of Canadian red spring wheat involves the segregation, at terminal elevators, of wheat grading No. 1 and No. 2 C.W. on the basis of protein content, in order to provide minimum guaranteed protein levels in export shipments of these two grades. The 1972 new-crop red spring wheat composites were therefore made up according to protein content — four levels (14, 13, 12 and 11%) for eastern prairie samples, and four levels (14.5, 13.5, 12.5, and 11.5%) for western prairie samples. Because of the rather low average protein content of the 1972 red spring wheat crop, the amount of wheat available for the highest level protein segregates will be extremely limited. It is expected, however, that there will be adequate quantities of wheats grading No. 1 and No. 2 Canada Western Red Spring at protein levels below 13.5%.

Within each of the grades No. 1 and No. 2 C.W. Red Spring Wheat, increasing protein content produced an increase in overall baking quality, specifically in baking absorption, loaf volume, loaf appearance and crumb color. Test weight and kernel weight decreased slightly as the protein increased; flour yield, however, tended to increase slightly. Alpha-amylase activity was at satisfactory low levels.

Wheat entering the grade No. 3 Canada Western is not segregated according to protein content. New-crop wheat of this grade was lower in test weight and hectoliter weight than the higher grades. No 3 grade wheat from the western portion of the prairies was lower in flour yield and higher in amylase activity than the other new-crop composites. Loaf volume for the No. 3 C.W. Red Spring Wheat was satisfactory for the wheat protein levels.

In comparison with the quality of cargo shipments exported from Canada during the fourth quarter (May, June, July) of the 1971-72 crop year, new-crop wheat was slightly higher in flour yield and baking absorption. For the No. 1 C.W. grade for which comparisons are possible, loaf volumes for wheats at each of the guaranteed minimum protein levels were slightly lower for the new crop than for fourth-quarter, cargo shipments. Alpha-amylase activity levels appeared to be quite satisfactory.

Amber Durum Wheat. Production of amber durum wheat in Western Canada in 1972 was estimated to total 73.5 million bushels, a significant increase over the previous year's 56 million bushel crop. A large portion of the new crop was affected by frost, weathering, and pink smudge. It is expected that about 55% of the new crop will grade No. 3 Canada Western Amber Durum Wheat, with perhaps 22% eligible for the grade No. 2 C.W.

Protein content of the durum crop averaged 12.8%, quite close to the level for each of the previous 2 years (13.1 and 12.9%). Test weight, kernel weight, and pigment content of both the semolina and spaghetti were higher than for last year's crop. The new variety Hercules was undoubtedly responsible for the increases in kernel weight and pigment content.

Barley. Barley production in Western Canada in 1972 was estimated to be 492 million bushels, about 14% below the record 1971 prairie crop of 570 million bushels. A cool July over the prairies produced a crop with more plump barley than usual and lower nitrogen content. Delays in harvest caused by wet weather in the central prairies caused considerable staining of the barley and adversely affected germination by increasing dormancy and water sensitivity. Northern Alberta and the Peace River area were covered with snow before most of the barley was harvested. The malting quality of the higher grades of barley has been good, but careful selection of material for malting will be required.

Flaxseed. The 1972 crop of flaxseed was estimated to be 19 million bushels, compared with 22.3 million bushels in 1971. The rather adverse growing and harvest conditions will doubtless reduce the amount of flax eligible for the top grade. Oil content of the new crop was 42.3%, compared with 41.4% for last year's. The protein content of the oil-free flaxseed meal averaged 41.1% compared with a value of 42.2% for the 1971 crop. Iodine values for the new crop averaged 185, two units higher than for the previous crop.

Rapeseed. The 1972 crop of rapeseed produced an estimated 57.3 million bushels, a very marked reduction from the 1971 record production of 95 million bushels. Low erucic acid content varieties, grown on a limited scale for the first time in 1971, were seeded to roughly 85% of the 1972 rapeseed acreage. The following quality data for 1972 crop rapeseed are reported, not on a dry basis as in the past, but on 8.5% moisture basis as used in the trade. The oil content of 1972 crop rapeseed averaged 39.5% (only 0.1% lower than the 1971 level on 8.5% moisture basis); and the protein content of the oil-free meal averaged 34.5% (2% below the comparable 1971 level). The erucic acid content of the oil averaged 6.6 with a range of 0.3 to 50.6.

Eastern Winter Wheat. The 1972 crop of white winter wheat grown in southwestern Ontario was estimated at 15 million bushels. The protein content of this crop as estimated by the Commission's Research Laboratory averaged 9.6%, a substantial drop from the 10.7% level of the 1971 crop.

Eastern Canadian Soybeans. Soybean production in Eastern Canada attained a new record in 1972 with an estimated 11.7 million bushels. The Commission's Research Laboratory, on the basis of a survey of the new crop, reported the average oil content to be 20.1% on a moisture-free basis, with a range from 17.9 to 21.8%. The protein content of the oil-free soybean meal, on a moisture-free basis, was 54.5%, with a range from 51.0 to 57.8.

Canada Eastern Corn. Lack of sufficient heat units through the growing season resulted in more immaturity and somewhat lower average test weight. Yields in Quebec were about 30% lower than in 1971 at 67 bushels per acre, but they were relatively unchanged in Ontario at 81.2. Total production was estimated to be 104 million bushels.

Meetings of Grain Standards Committees

The Western Grain Standards Committee convened two meetings in 1972. At the first meeting in Winnipeg on May 1, the Committee recommended standard and export standard samples for the new grades of No. 2 and No. 3 Canada Western Red Spring wheat that became effective for official inspections made on and after August 1, 1972. The Committee also reviewed the performance of the protein segregation system and proposals for changes in grading standards for 1973. The second meeting was held in Winnipeg on November 6 and 7, 1972. A report was presented by the Chief Grain Inspector on 1972 crop conditions and grades. The committee recommended the establishment of 38 samples as primary standards and 8 samples as export standards for the ensuing crop year. Further progress reports on the performance of the new grades and protein segregation were presented by Commission staff. The Director of the Grain Research Laboratory reviewed the details of laboratory investigations on the quality of 1972 crop production and the tentative standards and export standard samples examined and recommended by the members.

At its first meeting in London, Ont., on August 31, 1972, the Eastern Standards Committee selected and recommended 12 samples as standard samples for grades of winter wheat, oats, barley and rye, and received reports on growing conditions and factors affecting grades. The laboratory survey of the protein content of white winter wheat was presented, showing 9.6% as the mean for 472 samples covering 10 counties in Southern Ontario. The second meeting of the Eastern Committee, held in Montreal on November 14, 1972, received reports on growing and harvest conditions as well as grade quality of fall crops in Ontario and Quebec. The committee selected and recommended 13 as standard samples for corn, soybeans and pea beans; and passed a special resolution regarding the visual color quality minimum for No. 1 C.E. pea beans as a result of representations from the industry.

Dr. J. W. Morrison, C.D.A. Research Branch, Ottawa, a member of the Eastern and Western Committees reported to both on objectives and progress in research on cereal and other grains. Committee memberships as constituted under Section 17 of the Canada Grain Act 1970 are listed in Appendix B of this report.

Variety Testing

The Inspection Division examined and reported on visual kernel characteristics of just over 3,000 samples received from Canadian plant breeders, or about the same number as in 1971. This division reported to the Canada Committees on Grain Quality and Plant Breeding on 36 varieties of wheat and 28 varieties of spring and winter barley grown in 1972 eastern and western cooperative variety tests.

The Grain Research Laboratory each year carries out detailed quality tests on new varieties or cultivars of red spring wheat, amber

durum wheat and malting barley. These cultivars have been developed by plant breeders as potential new varieties of commerce for Canadian agriculture. This work is coordinated by the Canada Committee on Grain Quality. During the past year, this phase of work included tests on 16 cultivars of red spring wheat, 20 cultivars of amber durum wheat and 53 cultivars of barley grown in the annual cooperative test. In addition, the Laboratory carried out some preliminary quality tests on spring wheat and amber durum wheat, cultivars that are being considered for entry into the annual cooperative test.

Six of the barley varieties in the tests were subjected to extensive pilot malting and brewing studies. One six-row variety was not of satisfactory quality and three two-row varieties were also unsatisfactory. Two two-row lines were rated as equal to Betzes in malting and brewing properties.

Each year the Grain Research Laboratory takes part in a wheat quality evaluation program organized by the Crop Quality Council of the United States. Wheat varieties developed for the upper central and western portions of the American wheat belt are evaluated. In 1972, the Laboratory tested a total of 22 flour samples in this program.

SECTION 2—DOCUMENTATION AND ELEVATOR OPERATIONS

Grain Documentation

Statistics. Licensees are required to submit prescribed records and periodic reports of stocks and handlings of grain as a basis for the Commission's control and supervision of the elevator system. The Economics and Statistics Division also receives corresponding data from other divisions of the Commission, from the Canadian Wheat Board and from other organizations and associations within the grain trade. From this information the Division compiles and publishes comprehensive bulletins relating to the storage and movement of Canadian grain within the Canadian elevator system and to domestic and export markets. Throughout the year these reports were distributed to Canadian and overseas correspondents and also served as a basis for supervisory and regulatory assessments within the Commission, the Canadian Wheat Board and related agencies.

As the principal source of Canadian grain storage and handling statistics, the Division worked closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, and other federal and provincial government offices. On a correspondent basis it exchanged data and provided statistical assistance internationally with the Commonwealth Economic Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the Production and Marketing Branch of the United States Department of Agriculture.

Summary statistics pertaining to the 1971-72 crop year appear in the tables forming part of Appendix A and a list of the principal statistical releases is included in Appendix C.

Licensing and Bonding. At August 1, 1972, the Commission issued a total of 4,651 licences for all elevator categories, compared with 4,937 a year earlier. Total licensed storage capacity decreased to 673,078,560 bushels from 693,898,660 bushels. A reduction of 16.2 million bushels occurred in the primary elevator storage system, mainly reflecting the closing of elevators at stations where the service was no longer required. There were also reductions of 1.5 million bushels in the terminal sector, 2.0 million bushels in the transfer sector, and 1.1 million bushels in the process elevator sector. On March 15, 1972, the three prairie producer cooperative elevator companies purchased the primary and terminal elevators of one of the large line elevator companies. The respective provincial cooperative elevator companies gained 66 primary elevators in Manitoba with a storage capacity of 5.3 million bushels, 531 primary elevators in Saskatchewan with a storage capacity of 36.3 million bushels, 418 primary elevators in Alberta with a storage capacity of 32.0 million bushels and 3 primary elevators in British Columbia with a storage capacity of .4 million bushels. In the terminal elevator sector the three prairie producer cooperative elevator companies acquired four

elevators at Thunder Bay with a storage capacity of 21.2 million bushels and two elevators at Vancouver with a capacity of 7.1 million bushels. A summary of licences in force and licensed storage capacity is contained in Table A-2.

Guaranteed bonds in the amount of \$37,287,735 executed by 17 surety companies, were deposited with the Commission as security by licensees during the crop year 1971-72.

Terminal, transfer and primary elevator licensees were required to maintain adequate insurance on grain stocks in their licensed premises. The insurance policies supporting this coverage were filed with the Economics and Statistics Division, which in turn verified the adequacy of this coverage by comparison with regular stock reports submitted by licensees.

Registration. Operators of terminal and transfer elevators are required to issue terminal or transfer elevator receipts for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration become negotiable documents to be used as collateral by the grain companies in financing the movement of the grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver and Montreal, the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipment. In cooperation with the Canadian Wheat Board, the Division amended its control governing the registration and cancellation of transfer elevator receipts covering grain moving to Atlantic seaboard ports to require full registration of all export grain.

Primary Elevators

Inspection of Elevators. The Commission has Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Edmonton, to keep the Commission in close touch with the operations of licensed primary elevators in the Prairie Provinces.

During 1972, the Assistant Commissioners inspected 343 elevators in Manitoba, 427 in northern Saskatchewan, 617 in southern Saskatchewan and 539 in Alberta, a total of 1,926. This inspection included checks on scales, sieves, moisture meters and certain other equipment; deductions for shrinkage, and posting of current Commission regulations applying to primary elevators.

In addition to their regular program of inspections, the Assistant Commissioners assisted in the investigation of producers' complaints and of reported infractions of the Commission's regulations and orders. They also received and handled numerous inquiries from producers and elevator operators on various matters relating to primary elevator operations.

Weigh-overs. The results of the 1971-72 primary elevator weigh-over program conducted by licensed grain companies are summarized

in the following table. The relative patterns of overage and shortage percentages differ substantially from those reported for 1970-71, but compare closely with the weigh-over results in prior years.

The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners were given authority to deal directly with elevator managers and superintendents where excessive overages or shortages had been reported.

Elevators reporting	1971-72	1970-71
Shortages	421	429
Neither overages nor shortages	91	51
Overages of less than .25%	545	265
Overages of .25% to .50%	288	320
Overages over .50%	152	360
Total number of elevators weighed over	1,497	1,425

Tariff of Charges. During the crop year 1971-72 the maximum elevation charge for handling of grain at primary elevators remained unchanged.

Terminal, Process and Transfer Elevators

Services. All grain received at and shipped from licensed terminal elevators in the Western Division was sampled and graded by staff of the Inspection Division, and weighed under supervision of the Commission's weighing staff. Inspection and weighing services were also provided at licensed process elevators in the Western Division.

At licensed transfer elevators located at St. Lawrence River and Maritime ports, grain loaded into vessels for export was sampled, and inspected and certified. Other sampling, inspection and weighing services in the Eastern Division were provided only on request. The inspection unit at Chatham, Ont., sampled and graded a considerable volume of eastern-grown grain for the grain trade in that area.

Information on the quantity of grain inspected and weighed during the 1971-72 crop year is given in Appendix A.

Terminal Elevator Grain Drying. During the 1971-72 crop year, about 4 million bushels of high-moisture grain were artificially dried at terminal elevators under supervision of the Commission's Inspection Division, compared with some 16 million bushels in the previous year. This reduction in quantity reflected the general dry condition of crops harvested in the fall of 1971.

Weigh-overs. When possible, official weigh-overs are conducted annually at licensed terminal and transfer elevators by groups of employees of the Weighing and Inspection Divisions. While a weigh-over is in progress, all normal elevator operations cease, and the grain

handling equipment and stocks of grain remain under the full control of the weigh-over crew. The contents of every storage bin are weighed, sampled for verification of grade and recorded. This work may take from a few days to several weeks, depending on the size of the elevator and the quantity and type of grain in store. The Economics and Statistics Division compiles totals of outstanding elevator receipts and handlings by grain and grade, obtains statements of stocks on hand from the Weighing Division and summarizes the results of each weigh-over for review by the Commission. The purpose of these audits is to enable the Commission to determine whether the grain handling operations at elevators have resulted in any excessive overages or shortages in the various kinds and grades of grain, and to establish the validity of commercial documents covering stored grain.

During the 1971-72 crop year, 23 terminal and 10 transfer elevators were weighed over. An additional 9 elevators were weighed over before the end of December, 1972.

Inspection of Equipment. All automatic samplers, scales and equipment for transferring grain (to scales on receipt and from scales for shipment), in all licensed terminal elevators and serviced process and transfer elevators, were inspected periodically during the year. In accordance with the special arrangement with the Standards Branch of the Department of Consumer and Corporate Affairs, all scales in licensed terminal and transfer elevators were inspected, verified and certified by the Commission's scale inspectors acting as inspectors under the Weights and Measures Act. Special inspections were made when any doubt arose as to the accuracy of a scale.

Plans and specifications for new elevator facilities and alterations to elevators and grain handling equipment were examined before permission was given for commencement of work by elevator managers. A total of 10 such projects were reviewed, including installations of dust control systems, automatic scales and vessel loading facilities. When completed, new facilities and installations were inspected by officials of the Inspection and Weighing Divisions to ensure that no condition existed which might affect the efficiency of sampling or accuracy of weighing grain received and shipped.

New Equipment. The Inspection Division, in cooperation with elevator management, arranged for further installations of pneumatic sample transport systems in terminal elevators at Thunder Bay and Vancouver. The Commission has provided these transport systems to improve car unload grade information service to the elevator operators. This new equipment has been found particularly useful during the implementation of protein segregation of red spring wheat.

Manually operated scales in several elevators in both the Western and Eastern Divisions were modified by elevator managers to allow automatic control and operation. This new scale equipment was subjected to very thorough tests by scale technicians on the staff of the Commission's Weighing Division.

Tariffs of Charges. During 1972, the maximum elevation charge for handling of wheat, oats and barley at licensed terminal elevators at Thunder Bay, the Pacific Coast and Churchill was $4\frac{3}{8}$ cents per bushel; for rye, $4\frac{7}{8}$ cents; flaxseed, $5\frac{7}{8}$ cents; and rapeseed, $6\frac{7}{8}$ cents per bushel.

Canadian Government Elevators

The Commission manages and operates five inland terminals and one seaboard terminal elevator which comprise the Canadian Government Elevator system.

Handlings. Total receipts of grain during the 1971-72 crop year amounted to 29.0 million bushels. This was an increase of 10.6 million bushels over the previous year and surpassed the previous record of 27.6 million bushels attained in 1952-53. Approximately half the grain received was wheat; the balance consisted of barley, rapeseed, flax, mustard seed, canary seed and buckwheat. Shipments during the year totaled 27.9 million bushels. Several grain companies continued arrangements enabling producers to deliver grain directly to the elevators at Moose Jaw and Saskatoon. On numerous occasions the railways used the 'block-train' arrangement to move stocks of grain to export positions. This involved the loading of 50 to 80 cars per day at interior terminals. Receipts and shipments at various elevators were as follows:

ELEVATOR	Capacity	Stocks August 1, 1971	Receipts	Shipments	Stocks July 31, 1972
— thousands of bushels —					
Moose Jaw	5,500	2,244	4,362	1,821	4,785
Saskatoon	5,500	2,208	5,279	3,837	3,650
Calgary	2,500	1,512	3,396	3,584	749
Edmonton	2,350	965	2,665	3,606	12
Lethbridge	1,250	783	166	899	59
Prince Rupert	2,250	1 156	13,158	14,200	325
Totals	19,350	8,868	29,026	27,947	9,580

Charges. Charges for the 1971-72 crop year were the maximum allowed by the Canada Grain Regulations with the following exceptions at interior elevators: Storage charges on wheat, oats and barley were $1/45\text{¢}$ per bushel per day instead of $1/30\text{¢}$; and elevation charges for rapeseed were 6¢ per bushel instead of $6\frac{7}{8}\text{¢}$.

Commercial Trucking. The elevators at Moose Jaw and Saskatoon participated in a test program whereby commercial trucks were used to transport barley from primary elevators to these interior terminals. During the 10-week test period which terminated July 31, 1972, a total of 5.7 million bushels of barley were received and cleaned. The grain was forwarded to Churchill and Thunder Bay as required to meet export shipping commitments.

Equipment. Replacement of motors and drives at the Prince Rupert elevator was completed, and preliminary work was done on a similar project in the elevator at Edmonton. The modernization of cleaning facilities at Moose Jaw was continued with the installation of additional machines. At Saskatoon, scales were modified to provide for automatic electronic operation with controls located at ground level. Automatic fire alarm systems were installed at the Calgary, Moose Jaw and Saskatoon elevators. New roadways were constructed where necessary to facilitate delivery of grain by truck. These improvements were undertaken to increase grain handling efficiency, and where required, to comply with current labor safety and electrical codes.

Complaints and Inquiries

Producers' Complaints. During 1972, the Commission and the Assistant Commissioners investigated 17 written complaints about producer transactions with operators of licensed primary elevators. In most of the disputes, it was possible to arrange satisfactory settlements between the parties concerned.

In addition, the Assistant Commissioners dealt with a variety of informal complaints and, when necessary, advised elevator managers and local superintendents on correct procedures.

Cargo Shortage Complaints. The Commission received a total of five complaints about excessive shortages reported on vessel shipments unloaded at Eastern Canadian and U.S. ports. These shipments originated at Thunder Bay and senior members of the Weighing Division staff investigated the weighing and loading of the grain at the terminal elevators concerned. In regard to the unloading of the shipments at licensed eastern elevators, an official of the Weighing Division examined records and interviewed elevator personnel. The Weighmaster reported his findings to the Commission for review and forwarding to the complainants.

In addition, 11 complaints were received about outturn weights reported from overseas destinations. Investigations were conducted into the weighing of the shipments at the loading elevators in Canada and reports were forwarded to the complainants; no evidence was found to account for the reported shortages in weight. The Commission also reviewed information supplied by the complainants on unload procedures and equipment at the overseas ports.

Overseas Quality Complaints. A total of 13 complaints were received about aspects of the quality of grain shipped to overseas destinations. Thorough investigations were carried out by the Inspection Division or the Research Laboratory, depending on the nature of the complaint. Official samples taken from the shipments at the time of loading were studied and subjected to special tests. Where possible, these samples were compared with samples taken by the importers at the time of unloading overseas. Detailed reports of the Commission's investigations were sent to complainants for their information. On the basis of the tests on the loading samples, no justification was found for the complaints.

SECTION 3—RESEARCH, INFORMATION AND OTHER SERVICES

Research

Laboratory Research. The Grain Research Laboratory carried out research and other studies to resolve certain problems and obtain a better understanding of cereal and oilseed science.

The peptide gamma-glutamylcysteine has been isolated and identified from germ. The reactions of this sulfhydryl peptide and others present in wheat are being studied in an attempt to understand the mechanism of the improver reaction in dough. The study of sulfhydryl peptides is also being extended to see if they are involved in causing the properties characteristic of immature wheat.

Isolation and characterization of spring wheat alpha-amylases are being carried out so that an evaluation of this enzyme on the properties of bread can be evaluated.

A number of studies have been concluded in the field of pesticide residue analysis. The studies included the invention of a more rapid method of analysis, and experimentation to understand the source of spurious and interfering contaminants occurring during gas-liquid chromatographic analysis. The results of these studies enable the laboratory to analyze cereals and oilseeds more efficiently for pesticide residues. As in other years, all cargoes of wheat and barley leaving Canada for overseas destinations were monitored for the possible presence of organochlorine and organothiophosphate pesticide chemical residues.

In continuing dough-mixing studies, a direct-reading, energy-input meter was devised and incorporated into the GRL-1000 mixer so that compensation and zero corrections can be made automatically. This development makes possible a direct readout of the amount of energy incorporated into a dough during mixing.

Design studies have been completed for construction and installation of a 4-stand, 10-inch roll-diameter, experimental mill in the new building. A laboratory mill has also been designed and constructed for milling, from durum wheat, semolina similar in quality to that obtained by European semolina mills.

A significant effort is being made to improve existing methods and to test new procedures for determining the protein content of wheat. New analytical methods are desired because of the multiplicity of protein analyses required to carry out protein segregation of wheat into lots of guaranteed protein content. Of particular interest is an infrared reflectance technique, which seems to have potential because of its apparent simplicity and ease of usage.

A number of statistical studies are underway on the segregation of wheat according to protein content. One project involves the de-

velopment of methods to bin wheats of different protein content so that efficient procedures can be developed to obtain lots of wheat containing specific protein levels.

In cooperation with the Canadian Wheat Board, an assessment of durum varieties has been extended to include also conditions used by European millers and processors for this purpose. These involve milling, production of spaghetti, cooking, and organoleptic studies. Studies are also being carried out on factors that affect semolina granulation, and the effect of alpha-amylase on spaghetti properties.

In work on barley, emphasis is on enzyme research of barley, and of barley malts and extracts, and also of microbial enzyme preparations related to the production of 'barley syrups.' This research involves the studies of barley alpha- and beta-amylases, gum-degrading enzymes, and various peroxidases, phosphatases and dehydrogenases. A related study involved the examination of free sugar levels in developing barley kernels.

In oilseed research, studies have been initiated to gain a better understanding of factors affecting bushel weight. An existing analytical method for the analysis of erucic acid was modified to obtain the capability of analyzing every carlot designated as low-erucic rapeseed for erucic acid content.

Statistical and Economic Studies. The program of continuing studies of grain handling costs developed by the Economics and Statistics Division was expanded during the year. The costs of services within terminals operated by the Canadian Government Elevator Division of the Commission were analyzed in detail. Reports in all these areas were provided to Commission members to keep them informed of the adequacy of present levels of handling and storage tariffs within the industry. The Division further expanded its use of electronic data processing and telecommunication equipment in its service program and for protein identification management.

Information Program

Publications. The Commission issued a series of bulletins to provide wheat producers, elevator operators, exporters, millers and overseas purchasers with detailed information about Canada's new grades of red spring wheat. The first of these new grades was introduced on August 1, 1971, and the others became effective on August 1, 1972.

Statistics on the movement and storage of grain within the licensed elevator system were published and distributed regularly through a series of bulletins issued by the Economics and Statistics Division.

The Commission published and distributed separate crop bulletins containing detailed information about the quality of the 1972 crops of Canadian red spring wheat and Canadian amber durum wheat.

The Research Laboratory publishes a separate annual report providing a comprehensive summary of its activities. However, brief

reference to some of the highlights of Laboratory activities is made at appropriate points throughout this report. Results of Laboratory research projects, totaling 15 papers in all, were published in scientific and technical journals.

The Commission's publications are listed in Appendix C.

Meetings. Members of the Commission and senior officials accepted a number of invitations to address annual meetings of producer organizations and to discuss topics of current interest relating to the Commission's work. In addition, they attended meetings held by several agricultural and other organizations including the Canada Grains Council, National Farm and Business Forum, Hudson Bay Route Association, and university faculties of agriculture.

Members of the Laboratory's professional and senior technical staff attended a total of 18 scientific and technical conferences. A complete listing is included in the Laboratory's Annual Report.

The Commission convened regular meetings of the Western and Eastern Grain Standards Committees.

Overseas Visits. Missions composed of senior officials and technical experts of the Commission visited Europe, the United Kingdom, Japan, Hong Kong and southeast Asia. The purpose of these missions was to meet with importers, millers, cereal research and government personnel and provide them with detailed information about the new grades of Canadian red spring wheat. Discussions also dealt with the minimum protein guarantee relating to the No. 1 C.W. and No. 2 C.W. grades, proposals for further changes in Canadian grain grading specifications, and the quality of 1972 crops of Canadian grains and oilseeds. Members of the Research Laboratory staff visited research institutes in several European countries and Great Britain.

The Commission participated in the grain exhibit at the Canadian Trade Fair held in Peking, People's Republic of China, during August 1972, by arranging for one of the Assistant Commissioners to assist with preparation and staffing of the exhibit.

Tour of Commission Facilities. Many individuals and groups visited the Commission and toured its inspection and laboratory facilities, to discuss matters related to the grain trade and to obtain first-hand information about the functions and services of the Commission. Visitors included missions sponsored by the Canadian Wheat Board and other organizations from Algeria, Australia, Belgium, Cuba, Germany, Hong Kong, Japan, Nigeria and the United Kingdom.

Special arrangements were made to provide tours and lecture sessions for groups of country elevator managers, university students in agriculture, and assistant trade commissioners-in-training from the Department of Industry, Trade and Commerce.

Films. The Commission's films, *Canadian Wheat* and *Grain Handling in Canada*, were shown to many interested individuals and groups.

Mobile Exhibit. The exhibit was placed on display at 16 agricultural fairs or exhibitions in Manitoba, Saskatchewan and Alberta, and was visited by over 3,000 persons, mainly grain producers and country elevator managers. Members of the Commission's staff were in attendance to give information and advice to interested parties about the Commission's functions and services. Special emphasis was placed on varieties and grades of grain and the displays featured samples of the new Red Spring Wheat grades, Hercules variety amber durum wheat, and the low erucic acid varieties of rapeseed. Information was provided about such matters as protein segregation of wheat, recent changes in grades and grade specifications, handling of rapeseed at primary elevators, and control of stored grain insects.

Other Services

Pesticide Residue Monitoring. In continuation of the pesticide residue testing service provided to assure acceptability of shipments of Canadian grains in overseas markets, 1515 cargoes of red spring wheat, 269 cargoes of durum wheat and 439 cargoes of barley were examined.

Erucic Acid Monitoring for Rapeseed. As a high proportion of the 1972 rapeseed was Oro and Span varieties, which are low in erucic acid, a monitoring system for detection of high erucic acid carlots was introduced. Erucic acid content was determined on 1515 carlots, 117 cargoes, and 545 new-crop samples of rapeseed.

Introduction of New Grades and Protein Segregation of Wheat. A new wheat grading system was effected on August 1, 1971, by introduction of No. 1 C.W. Red Spring Wheat that was segregated at ocean terminals for export at specific levels of protein content. At the West Coast ports and Churchill, guaranteed protein levels were 14.5%, 13.5%, and 12.5%, and at Thunder Bay and Atlantic ports guaranteed levels were 15.0%, 14.0%, 13.0%, and 12.0%. This system was introduced to reduce the overall variability in protein levels of wheat shipments from Canada, and to meet world competition in wheats at guaranteed levels. The year's operation was successful, as indicated by our customers' considerable satisfaction, not only with the levels but with uniformity within the levels shipped. The guaranteed levels indicated above were given some protection to allow for sampling and analytical errors in our own and customers' laboratories, and the general standard deviation of all cargoes about our desired level was 0.15% protein. This value is within the normally accepted sampling and analytical error on a sample of wheat.

This very satisfactory level of performance, especially in the first year of operation, was achieved through a massive, concerted and continuous effort of all divisions of the Commission — Inspection, Economics and Statistics, Research Laboratory, and Executive — along with the transportation sections of the Canadian Wheat Board. The preparations for the introduction of the proposed segregation system extended over about 5 years' time in study of details, including that of

a biometric research group in the University of Manitoba that examined protein levels and distribution of these in crops and shipments in past years.

In simple form, the system involves a protein determination on a sample of every carlot of wheat shipped from a country elevator. This primary sample is sent by mail by the elevator operator to a protein testing laboratory at Winnipeg or Calgary. Information is sent to the port so that when the carlot arrives it is binned according to its grade and protein content. An unload sample is also analyzed at Winnipeg, Calgary or Thunder Bay, as a check on the primary operation. The decisions on the binning program are made on the basis of biometrical calculations on the distribution of protein in the area from which the sample originated, the current average of all shipments to the port, and the levels of protein offered from that port. These calculations are used to assist and predict the whole operation, which is monitored continuously by an operations group to ensure standards are maintained.

The feedback from the calculations is used by the Canadian Wheat Board Operations Section to order cars by blocks to meet the requirements for the export orders. The whole operation is managed by the integrated efforts and skills of the appropriate sections of the Canadian Grain Commission and the Canadian Wheat Board; the response of the grain-handling companies, whose control of allocation of their cars at ocean terminals has been adjusted to the system to help ensure uniformity in binning and in cargo shipments, has been outstandingly cooperative.

Entomology Services. The entomology laboratory for the Pacific Coast region completed its second year of operation and all export terminals were regularly inspected. Some 15,593 samples were monitored for infestation. A noticeable decrease in primary and secondary insects was reported and this was reflected in a very low incidence of insect interception in terminal stocks. Mite populations were significantly reduced, as a product of better bin sanitation and pesticide use. A cooperative inspection program, involving the Commission's Inspection Division and the Plant Protection Division of the Department of Agriculture was continued for lake vessels at Thunder Bay during loading and at unload at St. Lawrence ports. A new entomology laboratory was established at Thunder Bay, April 1, 1972, and staffed to cover licensed terminals in the area. Terminal sanitation was emphasized during the initial months of operation followed by specific bin storage assessments. Headquarters staff carried out periodic inspections of inland and eastern terminals and Ontario transfer elevators. A total of 2,842 samples were collected from these sources and, after Berlese extractions, appropriate treatments were ordered. Some 1,082 cutoff samples were also received from country points and each station manager was notified of any primary infestation. Corrective measures were taken before shipment of any stocks.

Moisture Testing Equipment Service. The accuracy of Model 919 moisture meters in various offices of the Grain Inspection Division is checked regularly by the Laboratory through circulation of standard

samples. At year-end, there were 125 Model 919 moisture meters equipped with 3-inch cell and 19 Model 919 meters equipped with 3½-inch cell in use in Inspection Division offices across Canada.

The Laboratory continues to study the application of Model 919 moisture meters to grains for which standard calibration charts may eventually be required.

Grain Appeal Tribunal. During the crop year 1971-72 a total of 131 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of cars officially inspected in the Western Division. The grades assigned by the Inspection Division were sustained in 121 cases. Most of the samples reviewed by the Tribunal represented carlot shipments of either wheat or barley, and covered a wide range of varieties and grades.

Grading Services to Producers. At 33,954, the total number of "Subject to Grade and Dockage" and other unofficial samples inspected for producers and the trade was higher than in 1970-71 by about 7%, and nearly 50% of these were from oilseed crops. Producers' special bin barley carlot shipment complaints totaled 25. The Chief Inspector's comparisons of primary delivery samples with final unload samples established that in five cases the identity of the producer's grain had not been preserved in handling through the country elevator and the parties concerned were able to achieve satisfactory settlements.

Service to Other Organizations. The Economics and Statistics Division functioned as a statistical support agency for the Canadian Wheat Board, by supplying them with all major reports and publications compiled by the Division, particularly those related to country elevator operations and the positioning of grain stocks.

The Division served as the prime source of grain handling statistics pertaining to the licensed elevator system for incorporation in a variety of statistical releases by Statistics Canada. In particular, this office supplied the Agricultural Division of Statistics Canada with the primary material for the joint annual publication, *Grain Trade of Canada*.

Special Acts Administration. Collection of the 1% levy under the provisions of the Prairie Farm Assistance Act was suspended at the end of the 1970-71 crop year. However, the levy was applied on the Canadian Wheat Board final payment on wheat, oats and barley for the 1970-71 crop year, and this brought total collections for the year to \$8,188,025.39. The final total of levy collected under the Act over the period from 1939 is \$215,566,863.03.

The Commission did not find it necessary to establish any maximum freight rates under the provisions of the Inland Water Freight Rates Act.

SECTION 4—PERSONNEL ADMINISTRATION

The senior executive structure of the Commission was reorganized pursuant to the recommendations of a management analysis study. A position of Executive Director was established with responsibility for the overall management and coordination of the operations of the various divisions of the Commission. Mr. E. E. Baxter, formerly Director of the Economics and Statistics Division, was appointed Executive Director.

Mr. V. Martens, Secretary and Director of Administration, was granted 3 years leave of absence to direct the formation of the new Canadian International Grains Institute.

The first step in implementing the reorganization of the Weighing Division was completed with the appointment of Mr. C. L. Wood as Weighmaster-Operations and Mr. S. M. Kasner as Weighmaster-Audits and Scales.

Senior retirements during the year included Dr. I. Hlynka, Assistant Director of the Grain Research Laboratory; Mr. W. S. Frazer and Mr. R. H. Taylor, Assistant Commissioners for Manitoba and Saskatchewan, respectively, and Mr. J. L. A. Doray, Chairman of the Grain Appeal Tribunal.

At December 31, 1972, total staff, exclusive of the Canadian Government Elevators, was 882 compared with 876 at the end of 1971. The staff of the Canadian Government Elevators totaled 235, an increase of 57 since December 31, 1971, fully accounted for by the employment of casuals to process larger than normal grain handlings.

At the close of the year, staffing action was in process to fill the positions of Director of the Economics and Statistics Division, Director of the Weighing Division, Secretary to the Commission, and Chairman of the Grain Appeal Tribunal.

During the year, 20 employees received certificates in recognition of 25 years' service in the Public Service of Canada.

APPENDIX A

Grain Statistics and Quality

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A-1—Supply and Disposition of Canadian Grain, Crop Year 1971-72

	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed	Totals
— thousands of bushels —							
SUPPLY							
Carry-over July 31, 1971	750,454	125,373	144,268	12,743	26,706	11,029	1,070,573
Production in 1971	529,552	363,479	601,628	21,915	22,321	95,000	1,633,895
Total supply	1,280,006	488,852	745,896	34,658	49,027	106,029	2,704,468
DISPOSITION							
Exports*	503,891	10,224	230,528	10,757	27,260	42,586	825,246
Consumed in Canada	186,453	360,306	319,525	8,108	5,735	20,304	900,431
Total disposition	690,344	370,530	550,053	18,865	32,995	62,890	1,725,677
CARRY-OVER (JULY 31, 1972)							
On farms (estimated)	317,500	96,000	106,000	5,500	6,000	16,300	547,300
In primary, process and terminal elevators	182,121	17,846	73,214	9,217	9,402	24,634	316,434
In store and afloat at eastern transfer elevators	59,126	2,097	10,884	380	170	118	72,775
In eastern flour mills	2,587	583	—	—	—	—	3,170
In transit by rail—Eastern and Western Divisions	28,328	1,796	5,745	696	460	2,087	39,112
In store and in transit to the United States	—	—	—	—	—	—	—
Total carry-over July 31, 1972..	589,662	118,322	195,843	15,793	16,032	43,139	978,791

* Includes 24,826,221 bushels of wheat flour, 981,026 bushels of bagged seed wheat, 25,158 bushels of rolled oats and oatmeal, 6, 265,297 bushels of barley malt and 1,518,636 bushels of flaxseed in linseed oil form.

A-2—Licences in Force and Storage Capacity, August 1, 1972 and 1971

Type of licence	Licences in force		Licensed storage capacity	
	1972	August 1 1971	1972	August 1 1971
Primary elevator	4,567	4,849	377,798,550	393,993,650
Terminal and process elevator	56	59	166,793,710	169,418,710
Transfer elevator	28	29	128,486,300	130,486,300
Grain dealer	16	19	*	*
Totals	4,667	4,956	673,078,560	693,898,660

* These licences do not cover grain storage facilities.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1971-72

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Canada Western Red Spring	176,068	69.7	—
Tough 1 Canada Western Red Spring	1,179	.5	—
3 Manitoba Northern	36,986	14.6	—
4 Manitoba Northern	20,948	8.3	—
Tough 3 and 4 Manitoba Northern	9,132	3.6	—
4 Special	1	*	—
No. 5	5,293	2.1	—
No. 6	493	.2	—
Feed	85	*	—
Garnet	5	*	—
Tough Others	1,035	.4	—
Damp	219	.1	—
Smutty	—	—	—
Rejected	1,145	.5	—
Others red spring	82	*	—
Total red spring wheat	252,671	100.0	86.3
1 Canada Western Amber Durum	1,944	5.3	—
2 Canada Western Amber Durum	13,687	37.0	—
3 Canada Western Amber Durum	9,305	25.2	—
Extra 4 Canada Western Amber Durum	6,369	17.2	—
4 Canada Western Amber Durum	4,572	12.4	—
5 Canada Western Amber Durum	197	.5	—
6 Canada Western Amber Durum	1	*	—
Tough durum	567	1.5	—
Others durum	320	.9	—
Total amber durum wheat	36,962	100.0	12.6
Total soft white spring	960	—	.3
Total mixed wheat	313	—	.1
Total Alberta winter wheat	1,904	—	.7
Total all wheats	292,810	—	100.0

* Less than 0.05%.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1971-72 (continued)

Grade	Carlots	Percentage
OATS		
1 Canada Western	—	—
2 Canada Western	102	.9
Extra 3 Canada Western	803	6.9
3 Canada Western	3,536	30.7
Extra 1 Feed	1,160	10.1
1 Feed	5,249	45.5
2 Feed	452	3.9
3 Feed	51	.4
Mixed Feed	48	.4
Tough	67	.6
Damp	—	—
Rejected	30	.3
Others	33	.3
Total oats	11,531	100.0
BARLEY		
1 Canada Western Six-Row	—	—
2 Canada Western Six-Row	644	.5
3 Canada Western Six-Row	15,577	12.6
1 Canada Western Two-Row	3	*
2 Canada Western Two-Row	1,209	1.0
3 Canada Western Two-Row	7,407	6.0
1 Feed	84,760	68.8
2 Feed	9,855	8.0
3 Feed	834	.7
Tough	2,668	2.2
Damp	98	.1
Rejected	74	.1
Others	38	*
Total barley	123,167	100.0

* Less than 0.05%.

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1971-72
(Continued)**

Grade	Carlots	Percentage
RYE		
1 Canada Western	—	—
2 Canada Western	2,476	43.4
3 Canada Western	2,914	51.0
4 Canada Western	103	1.8
Ergoty	120	2.1
Tough	86	1.5
Damp	5	.1
Rejected	4	.1
Others	2	*
Total rye	5,710	100.0
FLAXSEED		
1 Canada Western	13,381	96.6
2 Canada Western	152	1.1
3 Canada Western	87	.6
4 Canada Western	15	.1
Tough	144	1.0
Damp	11	.1
Rejected	41	.3
Others	24	.2
Total flaxseed	13,855	100.0
RAPESEED		
1 Canada	22,529	98.6
2 Canada	44	.2
3 Canada	24	.1
Others	240	1.1
Total rapeseed	22,837	100.0

* Less than 0.05%.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1971-72 (Concluded)

Grade	Carlots	Percentage
OTHER GRAINS		
Corn	30	—
Sunflower seed	735	—
Mixed grain	197	—
Screenings	301	—
Buckwheat	592	—
Soybeans	—	—
Peas	240	—
Sample grain	18	—
Safflower seed	8	—
Mustard seed	782	—
Condemned grain	18	—
	2,921	—
Grand total	472,831	—

A-4—Samples of Western Grain "Subject to Grade and Dockage" and Other Unofficial Samples Inspected, Crop Year 1971-72, Compared with Crop Year 1970-71

Point	1971-72	1970-71
	Number of samples	
Winnipeg	13,826	13,923
Calgary	6,676	6,424
Edmonton	530	1,703
Moose Jaw	2	101
Saskatoon	565	1,164
Lethbridge	12,345	8,292
Total	33,944	31,607

A-5—Inward Carlot Re-inspections of Western Grain, Crop Year 1971-72

Point	Inspected	Re-inspected	Un-changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	288,401	14,442	12,993	1,310	43	12	84
Winnipeg	6,525	623	534	56	23	1	9
Churchill	13,137	578	503	73	1	—	1
Moose Jaw	687	112	81	31	—	—	—
Saskatoon	3,588	176	155	17	3	—	1
Calgary	4,090	203	192	11	—	—	—
Edmonton	1,685	214	207	7	—	—	—
Medicine Hat	659	53	50	3	—	—	—
Lethbridge	62	—	—	—	—	—	—
Prince Rupert	6,982	428	385	42	—	1	—
Vancouver	147,015	7,885	6,991	836	11	12	35
Total	472,831	24,714	22,091	2,386	81	26	130
Percentage of total carlots	100.0	5.2	4.6	.5	*	*	*

* Less than 0.05%.

A-6—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1971-72

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	184	3,323	393	399	193
Oats	350	3,381	3	41	1
Barley	210	4,623	517	5	340
Flaxseed	1	314	517	512	63
Rye	—	98	—	1	1
Mixed grain	7	12	—	8	—
Corn	—	—	—	—	—
Buckwheat	—	25	4	—	—
Peas	11	—	—	—	—
Screenings	174	6,737	82	181	10
Rapeseed	1	69	22	359	1
Sample feed grain	16	—	6	—	—
Mustard seed	—	13	28	8	77
Sample grain	10	227	2	7	—
Total	964	18,822	1,574	1,521	686

Grain	Saskatoon	Lethbridge	Medicine Hat	Vancouver, Victoria and Prince Rupert	Churchill
Wheat	520	363	—	86	—
Oats	93	—	—	367	10
Barley	886	—	—	14	—
Flaxseed	—	—	—	2	—
Rye	3	—	—	1	—
Mixed grain	2	—	—	123	—
Corn	—	—	—	—	—
Buckwheat	—	—	—	—	—
Peas	—	—	—	—	—
Screenings	287	—	—	1,616	—
Rapeseed	622	22	—	9	—
Sample feed grain	14	—	—	—	—
Mustard seed	84	25	—	—	—
Sample grain	—	—	—	6	—
Total	2,511	410	—	2,224	10

A-7—Carlot Inspections of Eastern Grain, Crop Year 1971-72

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
1 Canada Eastern White Winter	—	15	31	46
2 Canada Eastern White Winter	—	18	582	600
3 Canada Eastern White Winter	—	1	94	95
4 Canada Eastern White Winter	—	—	6	6
5 Canada Eastern White Winter	—	—	1	1
2 Canada Eastern Mixed Winter	—	—	7	7
Tough	—	1	263	264
Damp	—	—	3	3
Sample	—	—	4	4
Total	—	35	991	1,026
OATS				
2 Canada Eastern White	—	2	—	2
3 Canada Eastern	—	1	—	1
Total	—	3	—	3
BARLEY				
3 Canada Eastern Six Row	—	—	22	22
4 Canada Eastern	—	2	3	5
Total	—	2	25	27
RYE				
1 Canada Eastern	—	—	1	1
2 Canada Eastern	—	—	12	12
3 Canada Eastern	—	—	1	1
Tough	—	—	1	1
Total	—	—	15	15

**A-7—Carlot Inspections of Eastern Grain, Crop Year 1971-72
(Continued)**

Grade	Montreal	Toronto	Chatham	Total
MIXED GRAIN				
Tough	—	1	—	1
Total	—	1	—	1
CORN				
Extra Dry 1 Canada Eastern Yellow	13	—	783	796
1 Canada Eastern Yellow	14	—	795	809
Extra Dry 2 Canada Eastern Yellow	51	—	436	487
2 Canada Eastern Yellow	56	—	565	621
Extra Dry 3 Canada Eastern Yellow	6	—	77	83
3 Canada Eastern Yellow	7	—	80	87
Extra Dry 4 Canada Eastern Yellow	—	—	14	14
4 Canada Eastern Yellow	—	—	9	9
Extra Dry 5 Canada Eastern Yellow	—	—	3	3
5 Canada Eastern Yellow	—	—	2	2
Tough	1	—	76	77
Damp	—	—	2	2
Moist	—	—	10	10
Sample	—	—	2	2
Total	148	—	2,854	3,002
BEANS				
Extra 1 Canada Eastern Pea	—	—	6	6
1 Canada Eastern Pea	—	—	71	71
2 Canada Eastern Pea	—	—	1	1
4 Canada Eastern Pea	—	—	2	2
Extra 1 Canada Eastern Light Red Kidney	—	—	1	1
1 Canada Eastern Light Red Kidney	—	—	5	5
Total	—	—	86	86

**A-7—Carlot Inspection of Eastern Grain, Crop Year 1971-72
(Concluded)**

Grade	Montreal	Toronto	Chatham	Total
SOYBEANS				
1 Canada Yellow	—	—	88	88
2 Canada Yellow	—	1	272	273
3 Canada Yellow	—	1	27	28
5 Canada Yellow	—	—	1	1
Tough	—	—	288	288
Damp	—	—	87	87
Moist	—	—	1	1
Total	—	2	764	766
Total, all grains	148	43	4,735	4,926

**A-8—Inspection of Eastern Grain in Cargoes, Bins, Trucks and Warehouses,
Crop Year 1971-72**

Grain	Montreal	Toronto	Chatham	Total
— bushels —				
Wheat	267,475	—	6,202,019	6,469,494
Corn	500,657	297,257	5,259,616	6,057,530
Beans	1,508	1,057	1,921,924	1,924,489
Soybeans	23,192	1,188	1,320,203	1,344,583
Buckwheat	91	—	—	91
Total	792,923	299,502	14,703,762	15,796,187

**A-9—Inward and Export Cargoes Sampled and Inspected,
Crop Year, 1971-72**

	Montreal	Sorel	Three Rivers	Quebec	Halifax & Saint John	Baie Comeau	Port Cartier	Total
				—bushels—				
Eastern grain								
Inward	2,133,661	190,752	—	—	—	507,151	—	2,831,564
Export	2,918,918	1,614,199	—	—	73,487	—	964,266	5,570,870
Western grain								
Inward	6,002,253	—	—	—	—	2,677,900	565,276	9,245,429
Export	64,590,948	42,509,399	23,252,817	34,614,076	34,644,704	91,619,587	97,519,949	388,751,480
Total	75,645,780	44,314,350	23,252,817	34,614,076	34,718,191	94,804,638	99,049,491	406,399,343

A-10—Grain Sampled but not Inspected, Crop Year 1971-72

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern grain							
Carlots	19	—	2	—	—	—	21
Inward cargoes (bu)	178,390	—	—	—	—	—	178,390
Outward cargoes (bu)....	—	—	—	—	—	—	—
Bin lots (bu)	288,481	—	—	—	—	—	288,481
Western grain							
Carlots	40	—	1	—	—	—	41
Inward cargoes (bu)	8,139,180	—	240,910	—	—	—	8,380,090
Outward cargoes (bu)	—	—	—	—	—	—	—
Bin lots (bu)	75,067	—	2,929	—	—	—	77,996
U.S.A. grain							
Carlots	—	—	—	—	—	—	—
Inward cargoes (bu)	2,865,580	—	—	—	—	—	2,865,580
Outward cargoes (bu) ..	655,796	—	6,412,152	—	22,813,555	9,707,716	39,589,219
Bin lots (bu)	64,500	—	—	—	—	—	64,500
Total—cars	59	—	3	—	—	—	62
 bushels	12,266,994	—	6,655,991	—	22,813,555	9,707,716	51,444,256

A-11—Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1971-72

Point	Wheat	Oats	Barley	Rye	Flaxseed
RECEIPTS					
			— bushels —		
Thunder Bay	341,530,465	31,558,395	215,171,997	5,335,450	16,033,856
Vancouver	197,748,363	165,128	53,370,761	6,500,699	10,032,513
Victoria	8,525,567	345	456	—	—
Prince Rupert	13,632,293	107	2,095	56,968	—
Churchill	20,691,101	—	5,471,304	—	—
Calgary	335,043	—	1,751,682	10,505	1,123,964
Edmonton	363,149	8,187	77,442	11,074	1,161,418
Lethbridge	25,610	—	8,866	—	34,998
Moose Jaw	1,265,913	2,259	2,700,189	6,564	228,446
Saskatoon	68,428	—	4,830,378	—	1,543
Total	584,185,932	31,734,421	283,385,170	11,921,260	28,616,738
SHIPMENTS					
			— bushels —		
Thunder Bay	322,586,050	36,909,908	204,119,580	5,353,789	17,036,170
Vancouver	192,540,934	2,382,788	50,662,429	6,282,373	9,625,823
Victoria	7,783,460	179,013	10,271	—	—
Prince Rupert	13,742,016	150,086	2,092	54,800	—
Churchill	20,570,872	229,525	4,917,994	—	—
Calgary	1,067,277	13,765	1,263,879	10,504	1,082,896
Edmonton	1,261,757	118,286	77,631	11,074	1,125,798
Lethbridge	786,660	1,556	8,866	—	—
Moose Jaw	586,660	4,611	887,500	4,586	147,162
Saskatoon	1,145,875	7,393	2,305,410	—	270
Total	562,071,561	39,996,931	264,255,652	11,717,126	29,018,119

A-11—Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1971-72—Continued

Point	Rapeseed	Buckwheat	Mustard seed	Peas	Miscellaneous*
RECEIPTS					
		— bushels —			
Thunder Bay	18,258,919	135,720	1,214,347	268,985	1,020,335
Vancouver	30,768,185	1,298,022	366,633	—	1,034,825
Victoria	1,007,504	—	—	—	353
Prince Rupert	—	—	—	—	—
Churchill	—	—	—	—	—
Calgary	76,685	16,778	80,331	—	1,251
Edmonton	998,824	—	38,543	—	6,881
Lethbridge	54,832	—	41,859	—	—
Moose Jaw	2,121	—	156,080	—	126
Saskatoon	187,712	—	191,295	—	—
Total	51,354,782	1,450,520	2,089,088	268,985	2,063,771
SHIPMENTS					
		— bushels —			
Thunder Bay	15,022,664	118,053	1,219,290	231,625	1,271,547
Vancouver	26,816,370	1,249,856	411,113	—	974,524
Victoria	908,248	—	—	—	5,240
Prince Rupert	—	—	—	—	19,343
Churchill	—	—	—	—	—
Calgary	77,195	13,148	54,184	—	1,365
Edmonton	992,429	—	18,916	—	—
Lethbridge	54,832	—	47,537	—	—
Moose Jaw	2,121	—	188,573	—	126
Saskatoon	171,071	—	198,564	—	8,308
Total	44,044,930	1,381,057	2,138,177	231,625	2,280,453

(*) 50 pounds/bushel.

**A-12—Carlots Weighed, Leaking or with Defective Seals, in the
Western Division,
Crop Years 1970-71 and 1971-72**

	Number		Percentage of total	
	1971-72	1970-71	1971-72	1970-71
Cars weighed in	461,473	402,499	100.0	100.0
Inward cars leaking	49,666	51,963	10.8	12.9
Inward cars with missing or defective seals	22,356	18,247	4.8	4.5
Cars weighed out	26,166	21,224	—	—

**A-13—Average Reported Outturn Shortage on Vessel Shipments of Grain
from Thunder Bay to Licensed Eastern Elevators, Crop Year 1971-72**

Grain	Bushels shipped	Shortage —pounds/1,000 bu.	
		1971-72	1970-71
Wheat	258,079,016	37.09	35.54
Durum Wheat	51,285,540	56.96	42.19
Oats	18,887,372	39.04	24.41
Barley	176,347,812	39.22	41.44
Rye	1,467,093	117.64	50.78
Flaxseed	2,881,097	87.45	32.99
Rapeseed	600,324	—	—
Screenings (in tons)	101,778	2.67 ton	1.77 ton

A-14—Tough and Damp Grain Dried at Terminal Elevators, Crop Year 1971-72

	Artificial drying			Natural drying	Total
	Tough	Damp	Total		
— bushels —					
Thunder Bay					
Wheat	2,647,553	370,586	3,018,139	6,463,215	9,481,354
Durum	1,615	11,876	13,491	610,025	623,516
Oats	—	—	—	26,587	26,587
Barley	2,694	249,264	251,958	3,272,561	3,524,519
Rye	—	3,978	3,978	44,446	48,424
Flaxseed	15,482	19,610	35,092	147,944	183,036
Rapeseed	—	—	—	7,308	7,308
Buckwheat	—	—	—	2,393	2,393
Mixed Grain*	173	—	173	—	173
Total	2,667,517	655,314	3,322,831	10,574,479	13,897,310
Pacific Coast					
Wheat	5,269	292,315	297,584	5,096,540	5,394,124
Durum	—	—	—	65,057	65,057
Oats	—	—	—	—	—
Barley	—	—	—	1,615,990	1,615,990
Rye	2,211	—	2,211	88,512	90,723
Flaxseed	1,152	—	1,152	12,724	13,876
Rapeseed	—	—	—	5,953	5,953
Buckwheat	5,978	59,654	65,632	37,381	103,013
Total	14,610	351,969	366,579	6,922,157	7,288,736
Interiors					
Wheat	—	—	—	11,993	11,993
Rapeseed	—	—	—	1,007	1,007
Mustard seed	—	—	—	2,210	2,210
Total	—	—	—	15,210	15,210
Churchill					
Wheat	—	—	—	14,236	14,236
Barley	—	—	—	3,970	3,970
Total	—	—	—	18,206	18,206
Total, all locations	2,682,127	1,007,283	3,689,410	17,530,052	21,219,462

(*) 50 pounds/bushel.

A-15—Quality Data for Grades of Hard Red Spring Wheat Marketed, Crop Year 1971-72

	1 C.W. Red Spring Wheat						
	15	14.5	14	13.5	13	12.5	12
Test weight, Avery, lb/bu	65.0	65.8	65.9	66.5	66.2	67.0	66.8
1000-kernel weight, g	27.9	28.6	28.7	29.3	29.5	30.2	28.7
Wheat protein content, %*	15.0	15.0	14.2	14.0	13.6	13.0	12.7
Flour protein content, %**	14.2	14.1	13.3	13.0	12.5	12.0	11.5
Flour yield, %	75.0	74.6	75.2	75.6	75.3	75.1	75.3
Flour ash content, %	0.48	0.47	0.47	0.47	0.46	0.48	0.49
Flour diastatic activity, mg	180	184	181	199	187	211	189
Baking absorption, %	63.0	63.0	62.0	62.0	62.0	61.0	61.0
Loaf volume, cc	940	935	895	845	825	785	755

	3 Northern	4 Northern	No. 5	No. 6
Test weight, Avery, lb/bu	65.1	63.8	61.3	60.3
1000-kernel weight, g	30.1	30.7	29.9	26.8
Wheat protein content, %*	13.2	13.2	13.5	13.0
Flour protein content, %**	12.3	12.2	12.1	11.6
Flour yield, %	75.3	74.3	72.4	67.5
Flour ash content, %	0.48	0.48	0.53	0.57
Flour diastatic activity, mg	215	200	258	367
Baking absorption, %	61.0	61.0	61.0	59.0
Loaf volume, cc	805	795	755	615

(*) 13.5% moisture basis.

(**) 14.0% moisture basis.

A-16—Carlots Inspections Appealed, Crop Year 1971-72

Item	Carlots	Percentage
Left as graded	121	92.4
Grade raised	10	7.6
Grade lowered	—	—
Total	131	100.0

A-17—Prairie Farm Assistance Act Collections, Crop Year 1970-71

Province	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed	Total
	\$	\$	\$	\$	\$	\$	\$
Manitoba	392,032.08	46,051.96	115,577.99	10,316.26	99,374.54	57,234.13	720,586.96
Sask.	3,777,667.91	125,950.70	600,103.70	51,601.93	315,540.27	539,280.45	5,410,144.96
Alberta**	1,006,818.39	63,395.44	563,254.96	20,089.47	111,072.47	292,662.74	2,057,293.47
Totals	5,176,518.38	235,398.10	1,278,936.65	82,007.66	525,987.28	889,177.32	8,188,025.39
Total Collections crop year 1970-71*							8,188,025.39

**Includes Peace River area in B.C.

*Revised and final figures including levy deductions from Canadian Wheat Board final payments on the 1970-71 Pool accounts for wheat, oats and barley.

A-18—Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1972

Port of discharge	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed
	— cents per bushel —					
Georgian Bay Ports, Goderich, Sarnia and Walkerville	5.377	5.473	5.962	7.049	—	—
Port Colborne	6.389	6.473	6.957	6.633	—	—
Toronto	7.5	6.75	7.488	7.25	8.25	—
Kingston	6.625	—	9.75	—	—	—
Prescott	7.548	7.25	8.425	—	—	—
Montreal	9.021	7.225	8.264	9.0	—	—
Sorel	9.004	7.25	8.299	9.5	—	—
Three Rivers	9.0	7.071	8.293	—	—	—
Quebec	9.0	7.222	8.25	9.0	9.5	9.0
Boie Comeau	9.0	—	8.313	9.5	10.0	10.773
Port Cartier	9.035	—	8.271	—	—	—
Halifax	16.823	13.625	16.02	—	—	—
Other Maritimes	29.658	29.0	23.377	—	—	—
Buffalo	—	9.383	10.388	11.0	—	—
Chicago	—	—	9.982	—	—	—
Duluth-Superior	—	—	7.455	—	—	—
Manitowoc	—	—	9.079	—	—	—
Milwaukee	—	—	8.755	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

Schedule C was amended on January 27, 1972, to establish a revised maximum charge for preparing railway cars for loading grain at licensed terminal elevators

Schedule L was amended, effective August 1, 1972, by deleting the grades "Recleaned Feed Wheat" and "No. 4 Special" Red Spring Wheat.

Western Grain Standards Committee as at December 31, 1972

H. D. Pound M. M. Ainslie Dr. G. N. Irvine	Chief Commissioner Chief Grain Inspector Chief Chemist Chairman, Grain Appeal Tribunal	} Canadian Grain Commission
Dr. J. W. Morrison M. H. Rowland	} representing the Canada Department of Agriculture	
C. W. Gibbings	representing the Canadian Wheat Board	
N. H. McClure W. W. Sisler	} representing processors of grain	
G. E. Gould R. K. Lester	} representing exporters of grain	
John I. Miller R. E. Hadland Hubert N. Anderson H. R. Patching Elmer Kure Gordon South Devone R. Clark Avery K. Sahl Frank Dietz D. E. Campbell Wm. A. Ronald A. Bos	} representing producers of western grain	
*H. K. Moen	additional	

(*) Appointed pursuant to Section 17 (2) (h) to provide additional expertise on Committee.

Eastern Grain Standards Committee as at December 31, 1972

H. D. Pound M. M. Ainslie Dr. G. N. Irvine	Chief Commissioner Chief Grain Inspector Chief Chemist	} Canadian Grain Commission
Dr. J. W. Morrison	representing the Canada Department of Agriculture	
C. F. Bowker F. J. Reid E. Cordeau M. Pardo	} representing processors and exporters of grain	
M. R. McDougall Clarence Wilson Gus Sonneveld Kenneth Patterson	} representing producers of eastern grain	
Fernand Beaudet E. M. Jones G. C. Nichols	} additional*	

(*) Appointment pursuant to Section 17 (3) (e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Canadian Grain Commission Organization and Functions</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Red Spring Wheat. Crop Bulletin</i>	Annually
<i>Canadian Amber Durum Wheat. Crop Bulletin</i>	Annually
<i>Canadian Barley. Crop Bulletin</i>	Annually
<i>Canadian Flax and Rapeseed. Crop Bulletin</i>	Annually
<i>Canadian Wheat Cargoes. Bulletin</i>	Quarterly
<i>Canadian Durum Cargoes. Bulletin</i>	Quarterly
<i>Map of Western Canada showing the protein content of hard red spring wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Varietal Identification of Barley, Wheat and Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain through a Primary Elevator</i>	
<i>The Farmer and the Primary Elevator</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1972 Annual Report.

APPENDIX D

Revenue and Expenditure

Earned revenue and net expenditure of the Commission, including the Canadian Government Elevators, for the fiscal year 1971-72, compared with 1970-71, were as follows:

	1971-72	1970-71
Revenue	\$ 9,446,312	\$ 8,798,363
Expenditure	13,055,687	10,718,372

Further information is given in the following tables.

D-1—Earned Revenue and Net Expenditure, by Points and Divisions, Fiscal Year ended March 31, 1972

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
				— dollars —			
Winnipeg*	480	74,597	44,119	206,491	—	2,620,625	2,946,312
Churchill	—	115,628	58,080	—	—	—	173,708
Saskatoon	—	30,919	44,533	—	—	—	75,452
Moose Jaw	—	3,812	1,574	—	—	—	5,386
Medicine Hat	—	1,114	16,512	—	—	—	17,626
Lethbridge	—	16,539	858	—	—	—	17,397
Calgary	—	23,826	36,188	—	—	—	60,014
Edmonton	—	12,306	4,235	—	—	—	16,541
Vancouver	—	1,258,781	659,147	89,795	—	—	2,007,723
Victoria	—	42,268	21,135	—	—	—	63,403
Prince Rupert	—	67,158	34,581	—	—	—	101,739
Thunder Bay	—	2,500,514	1,279,396	—	—	—	3,779,910
Toronto	—	11,952	—	—	—	—	11,952
Chatham	—	91,509	—	—	—	—	91,509
Montreal	—	16,657	—	26,550	—	—	43,207
Baie Comeau	—	9,363	17,097	—	—	—	26,460
Port Cartier	—	2,487	3,563	—	—	—	6,050
Quebec	—	1,923	—	—	—	—	1,923
Total	480	4,281,353	2,221,018	322,836	—	2,620,625	9,446,312
EXPENDITURE							
				— dollars —			
Winnipeg*	400,946	915,569	229,702	527,345	1,089,681	3,132,357	6,295,600
Churchill	—	12,809	7,998	—	—	—	20,807
Saskatoon	26,555	84,140	48,536	—	—	—	159,231
Moose Jaw	—	16,815	—	—	—	—	16,815
Regina	25,998	—	—	—	—	—	25,998
Medicine Hat	—	—	17,468	—	—	—	17,468
Lethbridge	—	26,128	—	—	—	—	26,128
Calgary	—	285,598	56,228	—	—	—	341,826
Edmonton	33,426	46,451	—	—	—	—	79,877
Vancouver	—	854,391	665,158	145,042	—	—	1,664,591
Victoria	—	47,020	32,792	—	—	—	79,812
Prince Rupert	—	44,942	44,978	—	—	—	89,920
Thunder Bay	—	1,900,748	1,443,434	196,542	—	—	3,540,724
Toronto	—	27,208	—	—	—	—	27,208
Chatham	—	115,130	—	—	—	—	115,130
Montreal	—	390,829	18,374	36,389	—	—	445,592
Baie Comeau	—	39,370	16,281	—	—	—	55,651
Port Cartier	—	33,012	—	—	—	—	33,012
Quebec	—	20,297	—	—	—	—	20,297
Total	486,925	4,860,457	2,580,949	905,318	1,089,681	3,132,357	13,055,687

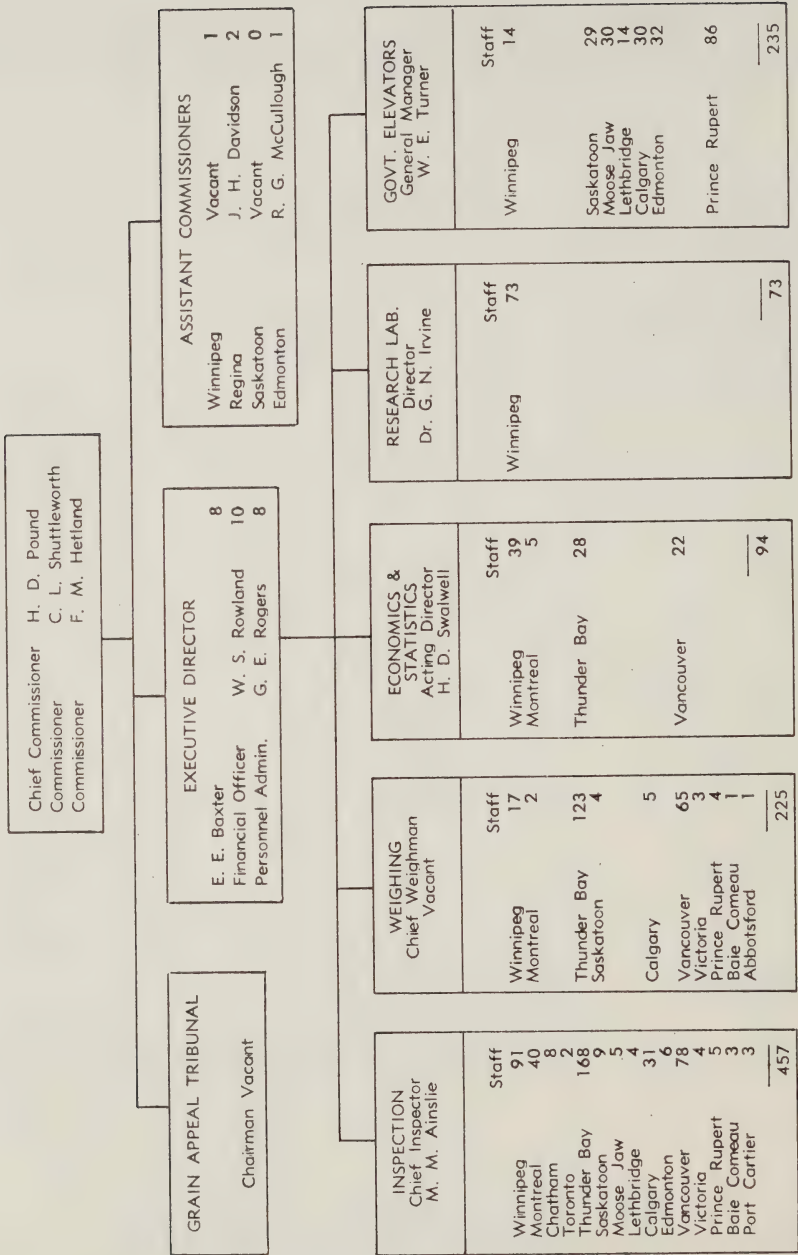
Note: (*) Revenue and Expenditure for all Government Elevators shown opposite Winnipeg.

D-2—Summary of Operations by Divisions, Fiscal Year Ended March 31, 1972

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
				— dollars —			
Fees	—	4,237,860	2,196,869	322,801	—	—	6,757,530
Overtime	—	24,662	22,599	—	—	—	47,261
Express charges	—	4,032	—	—	—	—	4,032
Samples sold	—	14,766	—	—	—	—	14,766
Refund of previous year's expenditures	—	33	1,550	10	—	—	1,593
Miscellaneous	480	—	—	25	—	—	505
Grain handling charges....	—	—	—	—	—	2,620,625	2,620,625
Total	480	4,281,353	2,221,018	322,836	—	2,620,625	9,446,312
EXPENDITURE							
				— dollars —			
Salaries	370,702	4,245,816	2,470,373	650,061	749,777	1,560,660	10,047,389
Rent of buildings	27,927	113,850	13,499	57,013	72,157	5,079	289,525
Travel	45,294	110,974	50,432	10,471	16,159	19,532	252,862
Purchase of equipment ..	—	66,226	—	—	85,002	626,111	777,339
Construction of buildings	—	22,966	—	—	—	—	22,966
Repairs and upkeep of buildings and works	—	295	—	—	—	100,770	101,065
Grants in lieu of taxes	—	—	—	—	—	424,347	424,347
Power (electrical)	—	—	—	—	—	114,616	114,616
Screenings	—	—	—	—	—	125,921	125,921
General expense	22,035	251,735	39,170	153,804	146,731	151,339	764,814
Printing, stationery and office equipment	20,967	48,595	7,475	33,969	19,855	3,982	134,843
Total	486,925	4,860,457	2,580,949	905,318	1,089,681	3,132,357	13,055,687

APPENDIX E

CANADIAN GRAIN COMMISSION



December 31, 1972.

Report of the

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[Canada]

CANADIAN

GRAIN

COMMISSION

1973



AGRICULTURE
CANADA

Minister Hon. Eugene Whelan Deputy Minister S. B. Williams

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Report of the

**CANADIAN
GRAIN
COMMISSION
1973**



**AGRICULTURE
CANADA**

Minister
Hon. Eugene Whelan

Deputy Minister
S. B. Williams

Information Canada
Ottawa 1974
Cat. No. A91-1/1973

CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba,
February 28, 1974.

The Honorable Eugene Whelan, M.P.,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

We are pleased to submit the 1973 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act.

The report contains a review of the Commission's principal activities during the year, together with information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1972-73 crop year, and a review of the quality of 1973 grain crops.

Respectfully submitted,

H. D. Pound,
Chief Commissioner.

C. L. Shuttleworth,
Commissioner.

F. M. Hetland,
Commissioner.

R. S. Allen,
Corresponding Secretary.

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INTRODUCTION

The Canadian Grain Commission is responsible for administering the Canada Grain Act and has general supervision over grain handling in Canada. It has the power to make regulations and orders that are consistent with the Act.

The Executive Division deals with policy and general administrative matters, provides financial and office services to all divisions, and includes the offices of the Assistant Commissioners.

The Inspection Division, which is the largest of the operational divisions, provides official inspection and grading of grain at various points across Canada, particularly grain received at and shipped from terminal elevators, and grain loaded to vessels for export at transfer elevators.

The Weighing Division is responsible for official weighing of grain at terminal, transfer and process elevators, weigh-overs of grain stocks, and also inspection and certification of scales in terminal and transfer elevators.

The Economics and Statistics Division conducts economic research, compiles and publishes complete data on the storage and handling of grain within the licensed elevator system, issues licences to elevator operators and grain dealers, supervises the bonding of licensees, registers terminal and transfer receipts, and provides documentation services to the industry for all grain unloads at licensed terminal elevators.

The Research Laboratory carries on a program of research related to the quality of cereal grains and oilseeds, conducts quality surveys of current crops and shipments, and tests new varieties in collaboration with plant breeders and the Commission's Inspection Division.

The Canadian Government Elevators system, which is managed, operated and maintained by the Commission, is comprised of six terminal grain elevators located in Western Canada. The elevator at Prince Rupert, B.C., handles grain for loading directly to ocean vessels.

In addition, the Commission constitutes Grain Appeal Tribunals, and Western and Eastern Grain Standards Committees. It also has responsibility for setting maximum lake grain freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

During 1973, the Commission moved its Winnipeg offices and laboratories to the new Canadian Grain Commission building located at 303 Main Street, Winnipeg, Man.

SECTION 1—GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1972-73

Record primary marketings and export clearances of the principal Canadian grains and oilseeds highlighted the heavy grain handlings witnessed in 1972-73.

Total stocks of Canadian wheat, durum wheat, oats, barley, rye, flaxseed, and rapeseed carried over into the 1972-73 crop year were estimated to be 952.8 million bushels with approximately 55% of this total held in farm storage. The 1972 crop totaled 1,440.3 million bushels and included 533.3 million of wheat (including durum wheat), 300.2 of oats, 518.3 of barley, 13.5 of rye, 17.6 of flaxseed, and 57.3 million of rapeseed. The combined inward carry-over and 1972 production provided an available supply of 2,393 million bushels, some 294 millions less than in the 1971-72 crop year.

For the first time in the history of the Canadian grain industry, producer deliveries of the above grains to the licensed elevator system (1,002.3 million) exceeded 1.0 billion bushels. This represented an increase of 43.2 million over 1971-72. However, no individual records were established. In fact, only wheat and oats marketings exceeded the previous year's volume.

Bulk exports of the major grains and oilseeds totaled a record high of 798.3 million bushels, surpassing by less than 1% the previous record of 791.6 million attained in 1971-72. Export clearances of rapeseed — 54.1 million — represented the only individual record. The only other grain with higher exports than in 1971-72 was wheat (including durum wheat) with clearances of 552.8 million bushels.

The 1972-73 commercial disappearance included 884.0 million bushels consumed in Canada for human food, feed, seed and industrial use. Combined with the exports of 798.3 million bushels, this left a carry-over on July 31, 1973 of 676.8 million bushels — some 276 million less than a year earlier. About 40% of the total was stored on farms.

Quality of Grain Marketed in 1972-73

Red Spring Wheat. the second and final stage of the introduction of a new series of Canada Western grades for red spring wheat (replacing the traditional Manitoba Northern grades) was implemented on August 1, 1972, the beginning of the 1972-73 crop year. During the 1972-73 crop year about 66% of the spring wheat carlot movement qualified for the grade No. 1 Canada Western; 17% qualified for the grade No. 2 Canada Western while about 8.5% qualified for the grade No. 3 Canada Western. Only about 8% of country elevator carlot shipments were graded tough and damp.

Carlots of red spring wheat graded No. 1 and No. 2 Canada Western, destined for export shipment out of Atlantic ports, were segregated on arrival in terminal elevators into a series of subgrades, based on protein content. At the Pacific Coast terminals, only those carlots of red spring wheat graded No. 1 Canada Western were segregated on the basis of protein content. In gen-

eral, the quality of the year's carlot movement of No. 1 Canada Western Red Spring Wheat differed little from that of the previous year's movement. At comparable protein levels, loaf volumes were essentially the same between years. Amylase activity levels were slightly lower for the 1972-73 movement. Ash content levels in the flour were slightly lower this year and, though flour color tended to be a little better this year, this was not reflected in crumb color.

At the beginning of the 1972-73 crop year, red spring wheat was available from Pacific ports at protein levels of 12.5, 13.5 and 14.5, and from Atlantic ports shipments were available at levels of 12, 13 and 14. Part way through the year a decision was made that export shipments from Atlantic ports should be available at the same levels as through Pacific ports and this change was gradually effected. Export shipments of No. 1 and No. 2 Red Spring Wheat from Atlantic ports were satisfactory in quality and were consistent with the guaranteed minimum protein level in every case. At the Pacific Coast, only the grade No. 1 Canada Western Red Spring Wheat was available at guaranteed protein levels. For this grade, quality was consistent with the guaranteed protein level.

Amber Durum Wheat. The durum wheat movement in the 1972-73 crop year decreased by about 12.5% from the movement in the previous crop year. About 37.4% of the carlot movement graded No. 1 and No. 2 Canada Western, 31.1% graded No. 3 C.W., and 16% entered the grade Extra No. 4. The proportion of the movement graded tough was very low, only about 2%. Test weight and 1000-kernel weight was higher this year than last for all grades. Pigment content levels in the wheat were about the same or higher this year in all grades, except for the grade Extra No. 4 C.W., which is made up predominantly of the lower pigmented variety Pelissier. Pigment levels in the spaghetti for all grades were equal to or higher than the levels of the previous year.

Export shipments of amber durum wheat from the Pacific Coast, again this year, represented a significant proportion of the total export volume. Relative to Atlantic Coast exports, these Pacific shipments were a little higher in 1000-kernel weight and a little higher in semolina and spaghetti pigment, except for the grade No. 3 C.W. However, grade for grade, there was very little difference in the overall color of the spaghetti between Atlantic and Pacific durum exports.

Barley. The volume of the barley movement in Western Canada in the 1972-73 crop year was about 31% less than the record barley movement (123,167 carlots) in the previous 1971-72 crop year. Of the carlots qualifying for the Canada Western grades, 11.1% were six-row barley, and 8.2% were two-row varieties. Barley entering the No. 1 Feed grade represented 65% of the movement. The malting quality of the grades No. 2 and No. 3 C.W. of both six-row and two-row barley movement of the 1972-73 crop year was good; kernel size was a little larger this year and nitrogen content fractionally lower. The demand for two-row malting barley for export continued. There was a steady overseas demand for this type of barley and the United States importation of Canadian barley is now mostly of the two-row type.

Oats. The overall quality was not as good as the 1971 crop. Only 25.9% of primary shipments graded No. 3 C.W. or higher, compared with 32.5% in these milling grades the previous year. Carlot shipments totaled 11,411 compared with 1,531 for the 1971-72 crop year.

Rye. The quality was excellent with 50% grading No. 2 C.W. A further 45% graded No. 3 C.W. with ergot the main degrading factor. Movement to terminals of 4,901 carlots was slightly lower than the previous year.

Flaxseed. the volume of the flaxseed movement in the 1972-73 crop year was 10,972 carlots, a decrease of about 21% from the previous crop year. As usual, most of the flax marketed (95.7%) was of top grade. Oil content for all grades averaged 42.4%, up 0.2 from the level of the previous year and up 0.4 from the 10-year average level. The protein content of the oil-free meal was 40.2% this year, more than one percentage unit lower than in the previous year (results reported on a dry matter basis).

Rapeseed. Rapeseed marketings in the 1972-73 crop year established a new record. About 91% of the 26,912 total carlot movement graded No. 1 Canada Rapeseed. Oil content of the rapeseed movement averaged 40.2% (8.5% moisture basis), the same level as in the previous crop year. Protein content of the residual oil-free meal averaged 36.1% (8.5% moisture basis), 0.8 units lower than for the previous crop year. The erucic acid level of the oil of the 1972-73 rapeseed movement averaged 19.9%.

Domestic Mustard Seed. Carlots inspected totaled 654, compared with 782 in the previous crop year. General quality was good, with immaturity and inseparable weed seeds the main degrading factors. Most of the mustard seed entered export channels.

Domestic Buckwheat. Carlot inspections were down slightly at 524. Grades and overall quality were satisfactory to meet the desirable level of No. 3 C.W. for export contracts.

Peas. As a result of increased production, 347 carlots were inspected compared with 240 in the previous crop year. The predominant grade was No. 3 Canada Western, Century variety, with soil tag and immaturity the main degrading factors.

Canada Eastern Grains. Total carlot inspections for all grains were lower by about one third at 3,344. Wheat inspections numbered 1,469, and slightly over 61% of inspections qualified for No. 1 or No. 2 C.E. White Winter. Corn inspections totaled 956, with 55% graded No. 1 or No. 2 C.E. Yellow. Soybean quality was generally good; 824 carlots were inspected with 33% graded an off grade because of excessive moisture. Pea bean quality was generally lower than the excellent quality the previous year and carlot inspections totaled 79.

Growing Conditions, Grades and Quality, 1973 Crop

The winter of 1972-73 was unseasonably mild across Western Canada and precipitation was well below normal. Early spring rains were heavy and widespread and ensured good germination once seeding was complete. Moisture conditions throughout the growing period were extremely variable; the southern areas received barely enough moisture and the more northerly areas received excessive rainfall, with some damage due to flooding. Grain from the southern areas of the prairies was harvested early under good weather conditions and was high in quality. The latter part of the harvest season was characterized by cool, wet weather and some areas received frost and rather heavy snowfall. Considerable acreage of grain and oilseeds in northern Alberta and in northwest Saskatchewan remained under the snow all winter.

Early harvested grains were of high quality but late harvested material reflected the effects of adverse weather conditions. Considerable sprouting

occurred, along with some rather severe weather staining, particularly in barley.

Red Spring Wheat. The 1973 crop of Western Canadian red spring wheat was estimated by Statistics Canada at 551.2 million bushels, a substantial increase from the 439.5 million bushel crop in 1972. The carry-over of spring wheat from previous crops at July 31, the end of the 1972-73 crop year, was estimated to be 304 million bushels, a significant decrease from the 521.5 million bushel carry-over a year earlier. About 45% of the 1973 red spring wheat crop is expected to qualify for the grade No. 1 C.W. Red Spring Wheat, about 37% for the grade No. 2 C.W. Red Spring Wheat, about 14% for No. 3 C.W. Red Spring Wheat, and the remaining 4% will enter the No. 3 Canada Utility grade.

The protein content of the 1973 red spring wheat crop averaged 13.3%. This level is slightly lower than the long-term average of 13.6% for all spring wheat crops for the twenty-year period 1953 to 1972, but it is higher than the 13.0 level of the 1972 crop. The 1973 crop wheat from Saskatchewan, Alberta and Manitoba averaged 13.4%, 13.3% and 12.9%, respectively.

Samples of the 1973 new-crop red spring wheat survey grading No. 1 and No. 2 C.W. were segregated on the basis of Protein content, to provide a series of subgrades with the protein content equal to or slightly exceeding the following levels — 14.5, 13.5, 12.5 and 11.5. These correspond to the minimum guaranteed protein levels expected to be available in export shipments of the No. 1 and No. 2 C.W. grades during the current crop year. These new-crop samples were further segregated into two groups, depending on whether the samples were grown in the Eastern or Western prairie portion of the growing areas. In view of the rather low average protein content of the 1973 red spring wheat crop, the amount of wheat available for the highest level protein segregates will perhaps be limited. However, it is expected that there will be adequate quantities of wheats grading No. 1 and No. 2 Canada Western Red Spring Wheat at 13.5% protein and lower levels.

Within each of the grades No. 1 and No. 2 C.W. Red Spring Wheat, increase in protein content is accompanied by a corresponding increase in overall baking quality, as indicated by higher loaf volume and baking absorption, better loaf appearance and crumb color. Test weight, kernel weight and flour ash all decrease with increase in protein; flour yield shows little change but flour color becomes slightly poorer; physical dough properties, as measured by the farinograph, extensigraph and amylograph, show a progressive increase in dough strength as protein content increases. Alpha-amylase activity tends to increase with increase in protein content, particularly for the grade No. 2 Canada Western.

Wheats of the grade No. 3 Canada Western are not segregated according to protein content. The protein content of this grade of 1973 crop wheat is similar to that of the higher grade wheats No. 1 and No. 2 C.W. at the protein level of 12.5% No. 3 C.W. Red Spring Wheat from the Eastern prairies compares favorably in milling and baking quality with No. 2 C.W. Red Spring Wheat at 12.5% protein; it is, however, slightly lower in test weight, higher in alpha-amylase activity, slightly poorer in flour color and slightly weaker in physical dough properties. No. 3 C.W. Red Spring Wheat from the Western prairies is significantly poorer in both milling and baking quality than Western prairie No. 2 C.W. Red Spring Wheat of 12.5% protein content.

Eastern prairie new-crop wheat of the grades No. 1 and No. 2 Canada Western is slightly lower in test weight, kernel weight and in both farinograph

and baking absorption than fourth quarter (May, June, July) cargo shipments. Alpha-amylase activity levels in the new crop are higher than in the fourth quarter exports, particularly for the No. 2 C.W. grade. No. 3 C.W. Eastern prairie new-crop wheat is essentially equal to recent cargo shipments in protein content, flour yield and in loaf volume. It is slightly higher in alpha-amylase activity level.

Western prairie new-crop wheat of the grades No. 1 and No. 2 Canada Western is also lower in test weight and kernel weight than fourth quarter (May, June, July 1973) Pacific coast cargo exports. Baking absorption, loaf volume and loaf characteristics for the new-crop wheats compare favorably with the levels of recent export shipments. Alpha-amylase activity is somewhat higher for the Western prairie wheat, particularly for the lower grades.

Amber Durum Wheat. Amber durum wheat production in Western Canada in 1973 was estimated to be 57.8 million bushels, a substantial decrease from the 73.5 million bushel crop in 1972. Pink smudge was again a major degrading factor in 1973; frost and weathering were other degrading factors. It is expected that about 25% of the crop will enter the two top grades, No. 1 and No. 2 Canada Western; the two grades No. 3 and No. 4 Canada Western will each include about 30% of the 1973 crop.

The protein content of the 1973 crop of amber durum wheat averages 13.4%, compared with 12.8% for the 1972 crop. Test weight and kernel weight are lower this year than last, probably as a result of the rather dry conditions under which a large part of the 1973 crop was grown. Pigment content of the semolina and the spaghetti for all grades except No. 4 Canada Western is significantly higher this year, reflecting the predominance of the two varieties, Hercules and Wascana. The farinograms for the wheats grading No. 1 and No. 2, and to a slightly lesser extent No. 3 Canada Western, are not quite as strong this year as last; this no doubt reflects the presence of the new variety Wascana which is somewhat lower in gluten strength than Hercules.

Barley. The 1973 crop of Western Canadian barley was estimated to be 449 million bushels, compared with the 492 million bushel crop in 1972. Hot weather in July, which prevailed over much of the barley growing area of Western Canada, hastened the maturation of the barley crop and decreased the percentage of plump barley in the crop, particularly for two-row barley, in southern and central Alberta. For the second year in succession, only the early ripened grain was harvested under good conditions. Later harvested barley which had lain in the swath through several rains and occasionally under some snow was severely weather-stained. Problems in dormancy and water sensitivity are widespread and careful selection of material for malting will be required.

Flaxseed. The Western Canadian crop flaxseed in 1973 was estimated to be 19.4 million bushels, a slight increase from the 17.6 million bushel crop in 1972. The poor harvest weather tended to reduce grades and also produced a somewhat larger than normal amount of tough and damp flaxseed. Oil content of the 1973 crop is 41.9%, slightly lower than the 42.3% level in the previous crop. The protein content of the oil-free flaxseed meal averages 41.8%, up slightly from the 41.1% level in the 1972 crop. The iodine value for the new crop averages 187 units, a very slight increase from the level of the previous crop.

Rapeseed. Western Canadian production of rapeseed in 1973 is estimated to be 53.2 million bushels, a slight decrease from the 57.3 million

bushel crop of 1972. Low erucic acid content varieties of rapeseed again predominated in the 1973 crop and accounted for about 85% of the acreage. This proportion is about the same as in the 1972 crop. The oil content of the 1973 rapeseed crop averages 39.0% (8.5% moisture basis). This level is 0.5% lower than that for the 1972 crop. The protein content of the oil-free rapeseed meal averages 35.5% this year (8.5% moisture basis), a full percentage point higher than the level for the 1972 crop. The erucic acid content of the rapeseed oil for the 1973 crop averages 6.9% with the values ranging from 0.2 to 43.4. Just over 70% of the new crop samples had an erucic acid content lower than 5%.

Eastern Winter Wheat. The 1973 crop of white winter wheat grown in southwestern Ontario is estimated to be 14.8 million bushels, a slight decrease from the 15.9 million bushel crop of the previous year. The protein content of the 1973 crop averaged 10.3%, a significant increase from the 9.6% level of the 1972 crop.

Eastern Canadian Soybeans. Production of soybeans in Eastern Canada in 1973 was estimated to be 14.6 million bushels, a new production record. A survey of the 1973 crop carried out by the Commission's Research Laboratory indicated the average oil content of the new crop to be 20.8% on a moisture-free basis, with the range values from 19.0 to 22.5%. The protein content of the oil-free soybean meal on a moisture-free basis was 53.0%, with a range from 50.3 to 56.5%.

Canada Eastern Corn. A favorable harvest season resulted in a better than average crop from the quality point of view. Yields in Quebec were substantially higher, estimated at 78.5 bushels per acre on production of 95,000 acres, compared with 67 bushels per acre on 140,000 acres in 1972. In Ontario the yield was relatively unchanged at an estimated 81.6 bushels per acre from 1,175,000 acres.

Meetings of Grain Standards Committees

The Western Grain Standards Committee met in Winnipeg November 5 and 6, 1973. The principal topics discussed were the impact of changes in grade specifications introduced on August 1, 1973, and the progress of the metric system implementation program. The Directors of the Grain Research Laboratory and the Grain Inspection Division presented reports concerning the grades and quality of 1973 crops. It was decided to appoint a sub-committee to conduct a special study of grading tolerances for export grain. The Commission's entomologist provided information on the incidence of insect infestations in carlots of grain and in elevator facilities. The Committee recommended the establishment of 49 samples as primary standards and 10 samples as export standards for the 1973-74 crop year.

Two meetings of the Eastern Standards Committee were held. On August 28, 1973, it met at London, Ont., and selected and recommended 14 samples as standard samples for grades of winter wheat, barley and rye. The second meeting was held at Montreal on November 9, 1973, and received reports on growing and harvest conditions as well as grade quality of fall crops in Ontario and Quebec. The Committee selected and recommended 15 samples as standard samples of corn, soybeans, pea beans and buckwheat.

At both meetings, following presentations of reports prepared by the Grain Research Laboratory, the members of the Committee discussed diffi-

culties encountered in making rapid determinations of moisture content in corn grown in Eastern Canada.

Dr. J. W. Morrison, CDA Research Branch, Ottawa, a member of the Eastern and Western Committees reported to both on objectives and progress in research on cereal and other grains. Dr. Morrison also provided the Committees with information about his visit, along with other departmental officials, to the People's Republic of China in June 1973.

Committee memberships as constituted under Section 17 of the Canada Grain Act 1970 are listed in Appendix B of this report.

Variety Testing

The Inspection Division examined about 3,500 samples in providing co-operation and assistance to plant breeders and scientists at Canada Agriculture Research Stations and universities, and to others, in support of varietal development programs for Canada. Included were 107 varieties in advanced stages of development, consisting of 48 varieties of wheat and 59 varieties of western and eastern barley.

Each year the Grain Research Laboratory carries out detailed quality tests on new varieties or cultivars of red spring wheat, amber durum wheat and malting barley. These cultivars, which represent potential new varieties of commerce for Western Canada, have been developed by plant breeders in private industry, the universities and the government service. The work is co-ordinated by the Canada Committee on Grain Quality. During 1973 this phase of the work included tests on 24 cultivars of red spring wheat, 15 cultivars of amber durum wheat and 59 cultivars of barley, grown in the annual co-operative test.

As the final stage in the evaluation of the quality of new cultivars of red spring wheat, the Grain Research Laboratory in 1973 organized a collaborative study of the quality of four Canadian bread wheat varieties. Twenty-four collaborators from six different countries participated in this study. The collaborators represented milling firms, bakeries, cereal technological institutes and universities. The collaborators evaluated the milling, baking and related quality characteristics of three wheat varieties in relation to the same characteristics for the Canadian standard of quality, Marquis. Detailed results of this study will be considered at the meetings of the Canada Committee on Grain Quality early in 1974.

The Grain Research Laboratory is privileged each year to take part in a wheat quality evaluation program sponsored by the Crop Quality Council of the United States. Wheat varieties developed for the upper midwest areas of the American wheat belt are evaluated. As part of this program in 1973, the Laboratory tested a total of 36 flour samples in this program.

SECTION 2 — DOCUMENTATION AND ELEVATOR OPERATIONS

Grain Documentation

Documentation Services. The Economics and Statistics Division provides a documentation and reporting service for grain unloaded in terminal elevators at Churchill, Thunder Bay, the Pacific Coast and the Canadian Government interior terminals. The basic carload information is extracted from reports of the inspection and Weighing Divisions to provide the input to the Division's computers for production of documents such as Certificates for Canadian Grain, Terminal Elevator Receipts and Terminal Elevator Outturns. These documents are produced in Winnipeg or Vancouver for distribution within the grain industry. A telecommunications system, involving direct computer to computer communication in some instances, enables the unload information to be summarized on magnetic tape for distribution to the grain handling companies, the railways and the Canadian Wheat Board. This information becomes direct input to the internal accounting systems of these organizations as well as providing the basis for calculating payments for grain, storage and freight.

Statistics. Licensees are required to submit prescribed records and periodic reports of stocks and handlings of grain as a basis for the Commission's control and supervision of the elevator system. The Economics and Statistics Division also receives corresponding data from other divisions of the Commission, from the Canadian Wheat Board and from other organizations and associations within the grain trade. From this information the Division compiles and publishes comprehensive bulletins relating to the storage and movement of Canadian grain within the Canadian elevator system and to domestic and export markets. Throughout the year these reports were distributed to Canadian and overseas correspondents and also served as a basis for supervisory and regulatory assessments within the Commission, the Canadian Wheat Board and related agencies.

As the principal source of Canadian grain storage and handling statistics, the Division worked closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, and other federal and provincial government offices. On a correspondent basis, it exchanged data and provided statistical assistance internationally with the Commonwealth Economic Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the United States Department of Agriculture.

Summary statistics pertaining to the 1972-73 crop year appear in the tables forming part of Appendix A and a list of the principal statistical releases is included in Appendix C.

Licensing and Bonding. As at August 1, 1973, the Commission issued a total of 4,468 licences for all elevator categories compared with 4,651 a year earlier, plus 17 grain dealer licences compared with 16 the year previous. Total licensed storage capacity decreased to 660,876,410 bushels from 673,078,560 bushels. A reduction of 9.8 million occurred in the primary elevator system, and transfer elevator capacity dropped 3.5 million. The process elevator capacity reflected an increase of 1.1 million and terminal storage was unchanged from a year ago.

Guarantee bonds in the amount of \$36,050,235 executed by 14 surety companies were deposited with the Commission as security by the licensees during the crop year 1972-73.

Terminal, transfer and primary elevator licensees were required to maintain adequate insurance on grain stocks in their licensed premises. The insurance policies supporting this coverage were filed with the Economics and Statistics Division, which in turn verified the adequacy of this coverage by comparison with regular stock reports submitted by licensees.

Registration. Operators of terminal and transfer elevators are required to issue terminal or transfer elevator receipts for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration become negotiable documents to be used as collateral by the grain companies in financing the movement of the grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver and Montreal, the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipment.

Primary Elevators

Inspection of Elevators. The Commission has Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Calgary, to keep the Commission in close touch with the operations of licensed primary elevators in the Prairie Provinces.

During 1973, the Assistant Commissioners inspected 538 elevators in Manitoba, 698 in Saskatchewan and 468 in Alberta, a total of 1,704. This inspection included checks on scales, sieves, moisture meters and certain other equipment; deductions for shrinkage, and posting of current Commission regulations applying to primary elevators.

In addition to their regular program of inspections, the Assistant Commissioners assisted in the investigation of producers' complaints and of reported infractions of the Commission's regulations and orders. They also received and handled numerous inquiries from producers and elevator operators on various matters relating to primary elevator operations.

Weigh-overs. The results of the 1972-73 primary elevator weigh-over program conducted by licensed grain companies are summarized in the following table.

The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners were given authority to deal directly with elevator managers and superintendents where excessive overages or shortages had been reported.

Elevators reporting	1972-73	1971-72
Shortages.	414	421
Neither overages nor shortages . . .	27	91
Overages of less than .25%	310	545
Overages of .25% to .50%	383	288
Overages over .50%	526	152
Total number of elevators weighed over	1,660	1,497

Tariff of Charges. During the crop year 1972-73 the maximum elevation charge for handling of grain at primary elevators remained unchanged.

Terminal, Process and Transfer Elevators

Services. All grain received at and shipped from licensed terminal elevators in the Western Division was sampled and graded by staff of the Inspection Division, and weighed under supervision of the Commission's weighing staff. Inspection and weighing services were also provided at licensed process elevators in the Western Division.

At licensed transfer elevators located at St. Lawrence River and Maritime ports, grain loaded into vessels for export was sampled, and inspected and certified. Other sampling, inspection and weighing services in the Eastern Division were provided only on request. The inspection unit at Chatham, Ont., sampled and graded a considerable volume of eastern-grown grain for the grain trade in that area.

Information on the quantity of grain inspected and weighed during the 1972-73 crop year is given in Appendix A.

Terminal Elevator Grain Drying. During the 1972-73 crop year, about 24 million bushels of high-moisture grain were artificially dried at terminal elevators under supervision of the Commission's Inspection Division, compared with some 4 million bushels in the previous year. This increase in quantity reflected the greater proportion of high-moisture grain in carlots shipped to terminal elevators from crops harvested in 1972.

Weigh-overs. When possible, official weigh-overs are conducted annually at licensed terminal and transfer elevators by groups of employees of the Weighing and Inspection Divisions. While a weigh-over is in progress, all normal elevator operations cease, and the grain handling equipment and stocks of grain remain under the full control of the weigh-over crew. The contents of every storage bin are weighed, sampled for verification of grade and recorded. This work may take from a few days to several weeks, depending on the size of the elevator and the quantity and type of grain in store. The Economics and Statistics Division compiles totals of outstanding elevator receipts and handlings by grain and grade, obtains statements of stocks on hand from the Weighing Division and summarizes the results of each weigh-over for review by the Commission. The purpose of these audits is to enable the Commission to determine whether the grain handling operations at

elevators have resulted in any excessive overages or shortages in the various kinds and grades of grain, and to establish the validity of commercial documents covering stored grain.

During the 1972-73 crop year, 13 terminal and 16 transfer elevators were weighed over. An additional 20 elevators were weighed over before the end of December 1973.

Inspection of Equipment. All automatic samplers and equipment for transferring grain (to scales on receipt, and from scales for shipment) in all licensed terminal and serviced process and transfer elevators were inspected periodically during the year. All scales in licensed terminal and transfer elevators were inspected, verified and certified by scale inspectors on the staff of the Commission's Weighing Division. These inspectors act as inspectors under the Weights and Measures Act by special arrangement with the Department of Consumer and Corporate Affairs. In addition, special inspections were made by Weighing Division scale inspectors whenever any doubt arose as to the continued accuracy of a scale in a terminal or transfer elevator.

Plans and specifications for new elevator facilities and alterations to elevators and grain handling equipment were examined before permission was given for commencement of work by elevator managers. A total of 18 such projects were reviewed, including installations of dust control systems, automatic scales and vessel loading facilities. When completed, new facilities and installations were inspected by officials of the Inspection and Weighing Divisions to ensure that no condition existed which might affect the efficiency of sampling or accuracy of weighing grain received and shipped.

New Equipment. The Inspection Division, in co-operation with elevator management, arranged for further installations of pneumatic sample transport systems in terminal elevators at Thunder Bay and Vancouver. The Commission has provided these transport systems to improve car unload grade information service to the elevator operators.

Numerous manually operated mechanical scales in terminal and transfer elevators were replaced by automated electronic scales and control systems. This new scale equipment and that installed in preceding years received thorough testing by scale technicians on the staff of the Commission's Weighing Division.

Tariff of Charges. During 1973, the maximum elevation charge for handling of wheat, oats and barley, at licensed terminal elevators at Thunder Bay, the Pacific Coast and Churchill was 4 3/8 cents per bushel; for rye, 4 7/8 cents; flaxseed, 5 7/8 cents; and rapeseed, 6 7/8 cents per bushel.

The maximum storage charge for transfer elevators in the Eastern Division was increased from 1/30 of one cent to 1/25 of one cent per bushel per day, effective April 15, 1973.

Canadian Government Elevators

The Canadian Grain Commission manages and operates five terminals and one seaboard terminal elevator which comprise the Canadian Government Elevator system.

Handlings. Total receipts of grain during the 1972-73 crop year were 45.8 million bushels. This was an increase of 16.8 million bushels, or 58%

over the previous crop year. This surpassed the all time record of 29.0 million bushels attained during the 1971-72 crop year. Total shipments of grain were 49.3 million bushels. This was a 21.3 million bushel increase over the previous year. Approximately two thirds of the grain received was wheat with the balance consisting of barley, oats, flaxseed, rapeseed, mustard seed and canary seed. Receipts and shipments at various elevators were as follows:

Elevator	Capacity	Stocks August 1, 1972	Receipts	Shipments	Stocks July 31, 1973
— thousands of bushels —					
Moose Jaw	5,500	4,785	1,792	5,858	719
Saskatoon	5,500	3,650	4,492	5,189	2,953
Calgary	2,500	749	4,868	4,484	1,133
Edmonton	2,350	12	4,255	3,745	522
Lethbridge	1,250	59	103	119	43
Prince Rupert	2,250	325	30,359	29,920	764
Total	19,350	9,580	45,869	49,315	6,134

Charges. Charges for the 1972-73 crop year were the maximum allowed by the Canada Grain Regulations with the following exceptions at interior elevators: Storage charges on Wheat, oats and barley were 1/45c per bushel per day instead of 1/30c; and elevation charges for rapeseed were 6c per bushel instead of 6 7/8c.

Commercial Trucking. During the course of the year both the Saskatoon and Moose Jaw elevators participated in a small commercial trucking operation where wheat and barley were handled. The grain was subsequently forwarded to Churchill and Thunder Bay as required by the Canadian Wheat Board to meet their export shipping commitments.

A new venture whereby corn was received and dried in the Lethbridge elevator, was undertaken. It is anticipated that an increasing acreage will be devoted to growing of corn in the Lethbridge area during the next few years.

Equipment. The electrical and mechanical rehabilitation program at Prince Rupert was completed and a good start on a similar project was made at the Edmonton elevator. The modernization of cleaning facilities at Saskatoon was commenced with the installation of additional machines. Electro magnets were installed at the Moose Jaw elevator for removal of metal objects which might be contained in grain received for storage. A drier was installed at the Lethbridge elevator to facilitate the receiving, drying and shipping of corn.

Complaints and Inquiries

Producers' Complaints. During 1973, the Commission and the Assistant Commissioners investigated 13 written complaints about producer transactions with operators of licensed primary elevators. In all of the disputes it was possible to arrange satisfactory settlements between the parties concerned.

In addition, the Assistant Commissioners dealt with a variety of informal complaints and, when necessary, advised elevator managers and local superintendents on correct procedures.

Cargo Shortage Complaints. The Commission received a total of three complaints about excessive shortages reported on vessel shipments unloaded at Eastern Canadian ports. Two of these shipments originated at Thunder Bay and senior members of the Weighing Division staff investigated the weighing and loading of the grain at the terminal elevators concerned. In regard to the unloading of the shipments at licensed eastern elevators, an official of the Weighing Division examined records and interviewed elevator personnel. The Director reported his findings to the Commission for review and forwarding to the complainants.

In addition, three complaints were received about outturn weights reported from overseas destinations. Investigations were conducted into the weighing of the shipments at the loading elevators in Canada and reports were forwarded to the complainants; no evidence was found to account for the reported shortages in weight. The Commission also reviewed information supplied by the complainants on unload procedures and equipment at the overseas ports.

Overseas Quality Complaints. A total of six complaints were received about aspects of the quality of grain shipped to overseas destinations. Thorough investigations were carried out by the Inspection Division or the Research Laboratory, depending on the nature of the complaint. Official samples taken from the shipments at the time of loading were studied and subjected to special tests. Where possible, these samples were compared with samples taken by the importers at the time of unloading overseas. Detailed reports of the Commission's investigations were sent to complainants for their information. On the basis of the tests on the loading samples, no justification was found for the complaints.

SECTION 3 — RESEARCH, INFORMATION AND OTHER SERVICES

Research

Laboratory Research. The Grain Research Laboratory maintains an active program of basic and applied research with studies on the composition and properties of the components of bread wheat, durum wheat, malting barley, oilseeds, and on products derived from these. The move into new quarters in the new Grain Commission Building in mid-1973 interrupted all Laboratory programs to some extent; certain programs, particularly in the malting area, suffered very serious setbacks as a result of the move.

Enzymes play very important roles in determining the utility of grains and grain products in human food and animal feed processing operations. Several studies presently under way in the Laboratory are concerned with some of the different enzymes of cereal grains. Changes in the levels of the enzymes catalase and polyphenol oxidase during the growth and maturation were followed for three wheat varieties, Park (a red spring wheat), Hercules (an amber durum wheat) and Lemhi (a soft white spring wheat). Both enzymes systems are found early in kernel development and decrease as maturation progresses. Apparently there are a number of polyphenol oxidase isozymes differing in activity and varying location of development withing the kernel.

Work is continuing on a project following the development of alpha-amylase in wheat. This enzyme system, too, is found early in wheat kernel development and decreases to very low levels at maturation. Enzyme isolation and characterization studies indicate three forms of alpha-amylase are present in red spring wheat.

A study is under way to develop and evaluate a procedure for determining proteolytic activity in wheat, by measuring the amount of free proline (one of the amino acids of wheat) in sound and germinated wheats. Large increases in free amino acid levels result when wheat is allowed to germinate; the distribution of free amino acids is similar to the amino acid composition of wheat with glutamine and proline being present in the largest amounts. Significant increases in glutamine and proline have been observed in wheats steeped in water for only three hours. The work is presently focused on perfecting a simple quantitative test for proline.

The effect of the degree of maturity in wheat on the milling and baking performance is being studied in a project where two cultivars, Manitou and Neepawa, were harvested at seven different stages of maturity — the growth period ranging from 67 to 109 days. Samples were stored for varying periods before milling and baking tests were commenced. Of particular interest is the bromate requirement and the bromate response in the baking tests.

Studies of the mechanical development of bread dough have continued. Bread has been prepared by the Chorleywood-type process in which the development of the dough before extrusion into the pan was achieved by (1) conventional high speed mixing, or (2) by multiple passes of the dough through modified sheeting rolls. The sheeting and folding treatment was capable of fully developing the dough in about 30 sheetings. Net energy consumption during conventional mixing and during development by sheeting was deter-

mined. Optimum development by the sheeting roll technique required only 10 to 15% of the energy requirement for peak dough development by conventional mixing.

The program of development of equipment for fundamental studies concerning both milling and baking continues and this has been aided materially by the move into considerably expanded quarters for the milling and baking sections in 1973. A new stainless steel G.R.L. purifier has now replaced the original model developed over 15 years ago. Two Laboratory-designed motor-driven stainless steel batch mixers for use with wheat and milled products have been placed in service. Construction of two additional G.R.L.-1000 dough mixers has been completed. One is a research model featuring an improved direct-reading energy-input measuring system which records energy consumption per unit of dough weight; energy consumption curves for doughs of different size may be compared directly.

Projects underway in the area of durum wheat research include: a study of the ash content (inorganic mineral matter) in durum wheat mill fractions in relation to spaghetti-making quality; a study to determine whether the inherent brown color of spaghetti processed from particular cultivars of durum wheat is in any way related to polyphenol oxidase activity; a study of the characteristics of starch in relation to the cooking properties of pasta products.

Barley research is presently concentrating upon a variety of enzyme systems that are present in the barley grain itself or that are elaborated during the malting process. The development of a series of three related cell-wall degrading enzymes has been followed during the steeping phase of malting. The three enzymes differed in their pattern of development, both within an individual barley cultivar as well as between different cultivars. These three enzymes were separated chromatographically and their characteristics have been studied.

Another barley research project has involved determination of the amylose content of over 100 barley samples from plant breeding programs. Amylose was determined primarily by an amperometric titration method. However, during this work, a colorimetric procedure using the Technicon AutoAnalyzer was developed for the screening of samples for amylose content. This technique may prove useful in selection of barleys for animal feeding programs.

Peroxidase isozyme patterns in mature barley kernels of about 100 barley cultivars have been examined, using a ployacrylamide-disc eletrophoresis technique. Cultivars can be classified into three groups on the basis of characteristic isozyme patterns. Segregation of peroxidase isozymes has been observed in progeny of crosses between parents with differing isozyme patterns.

In another study, changes in perioxidase activity and peroxidase isozyme patterns have been monitored throughout kernel development for two varieties. Centennial and Bonanza. Initially, most of the activity appears located in the husk, but peroxidase activity in the endosperm increased rapidly during later stages of kernel development. Lower orders of peroxidase activity were also detected in the pericarp, aleurone, scutellum and embryo.

Beta-amylase enzymes from mature barley have been isolated, purified and characterized and comparisons made with the properties of beta-amylase previously isolated from malted barley.

Methodology studies in determination of pesticide residues on cereals has permitted the application of the Laboratory's rapid method for assay of organochlorine and organothiophosphate residues to the monitoring of both amber durum wheat and barley. Rapeseed, which has been difficult to assay because of the high oil content, can be analyzed by the rapid method by reducing sample size and the use of more rigorous cleanup procedures. Oats and rye can also be monitored by the rapid method if the extracts are subject to appropriate filtration techniques.

A study of the available literature and of current research projects in Canada dealing with the feeding value of cereals, pulses and oilseed meals was instituted in July 1973. This study focuses on the principal factors affecting the relative value of each crop for feeding purposes and to what extent varieties and or grading factors may be related to feeding value of commercial crops that can be grown in Canada.

Statistical and Economic Studies. The Economics and Statistics Division undertook background studies preparatory to a review by the Commission of the structure and level of maximum grain handling tariffs for services rendered by licensees. The major research effort of the Division is being devoted to this study of the tariff system.

The Division began a study to review the structure and level of fees charged to the industry for services provided by the Commission.

The Economics and Statistics Division participated in the design and implementation of experimental harvest surveys of wheat with the objective of speeding and increasing the accuracy of the estimation of the protein content and other quality characteristics of the new crop. The Division undertook the data processing and analysis of these survey results.

A number of statistical research projects related to the segregation of wheat by protein content at terminal elevators were conducted with a view to the refinement of procedures for operating and monitoring the segregation system.

Information program

Publications. The Commission issued and distributed two booklets to provide elevator managers, processors, exporters and other interested parties with detailed information about the grades of Canadian grain and the factors used in determining the grades of grain samples in accordance with established standards of quality.

Statistics on the movement and storage of grain within the licensed elevator system were published and distributed regularly through a series of bulletins issued by the Economics and Statistics Division.

The Commission published and distributed a 1973 Red Spring Wheat Protein Map, and separate crop bulletins containing detailed information about the quality of the 1973 crops of Canadian red spring wheat, amber durum wheat, barley, and flax and rapeseed. Limited distribution was made of mimeographed reports of the results of quality surveys of the 1973 crop of Eastern white winter wheat and the 1973 crop of Eastern soybeans. The Laboratory also continued the publication of its regular quarterly cargo bulletins which provide detailed quality information for Canada's export shipments of red spring and amber durum wheat.

The Research Laboratory publishes a separate annual report providing a comprehensive summary of its activities. However, brief reference to some of the highlights of the Laboratory activities is made at appropriate points throughout this report.

A total of 10 scientific and technical reports detailing the results of Research Laboratory basic and applied research studies appeared throughout the year in six different scientific journals.

The Commission's publications are listed in Appendix C.

Meetings. Members of the Commission and senior officials accepted a number of invitations to address annual meetings of producer organizations and to discuss topics of current interest relating to the Commission's work. In addition, they attended meetings held by several agricultural and other organizations including the Canada Grains Council, the Rapeseed Association of Canada, National Farm and Business Forum, Hudson Bay Route Association, and university faculties of agriculture.

Members of the Research laboratory's professional and senior technical staff represented the Commission at a total of 16 scientific and technical conferences during the year; three of these were overseas conferences.

The Commission convened regular meetings of the Western and Eastern Grain Standards Committees.

Overseas Visits. Senior officials and technical experts of the Commission visited Europe, Great Britain, North and Northwest Africa, Japan and Zambia. The purpose of these visits was to meet with importers, millers, cereal research and government personnel to provide them with detailed information about the new grades of Canadian red spring wheat. Discussions also dealt with proposals for further changes in Canadian grain grading specifications, and the quality of 1973 crops of Canadian grains and oilseeds.

Tours of Commission Facilities. Many visitors and missions from foreign countries toured the inspection and laboratory facilities of the Commission during the year. These included oilseed missions from Czechoslovakia, India and Mexico; a French mission studying Canadian grain grading procedures; representatives of the Turkish Grain Board and the Japanese Food Agency, as well as missions from Iraq, Yemen and Switzerland, also, a delegation of scientists from China, and participants in the international grain industry course sponsored by the Canadian International Grains Institute.

Special tours and lecture sessions were arranged for groups of country elevator managers, university students in agriculture, and assistant trade commissioners-in-training from the Department of Industry, Trade and Commerce.

Films. The Commission's films *Canadian Wheat* and *Grain Handling in Canada*, were shown to many interested individuals and groups.

Other Services

Pesticide Residue Monitoring. The Research Laboratory program of monitoring Canadian cargo exports for residues of pesticide treatment chemical was continued throughout the year: 1,532 cargoes of red spring wheat, 309 cargoes of barley and 205 cargoes of amber durum wheat were checked for organochlorine and organophosphate residues to ensure acceptability in world markets.

Erucic Acid Monitoring of Rapeseed. A system of monitoring the carlot movement of rapeseed within Canada was instituted over a year ago. This program has been extended to include all cargoes of rapeseed exported from Canada. During 1973, the Research Laboratory determined the erucic acid level of 245 cargo samples and 2,324 carlot samples of rapeseed. Cargo samples were also checked for oil content and protein content of the oil-free rapeseed meal.

Protein Segregation of Wheat. The segregation at terminal elevators of red spring wheat by protein content, which began for No. 1 C.W. Red Spring Wheat on August 1, 1971, was extended to include the segregation of No. 2 C.W. Red Spring Wheat at Thunder Bay on August 1, 1972. During December 1972, the guaranteed levels of protein content of No. 1 C.W. Red Spring Wheat segregated at Thunder Bay were changed to 13.5%, 12.5% and 11.5% from the previously segregated guaranteed levels of 14.0%, 13.0% and 12.0%. Guaranteed protein levels of No. 2 C. W. Red Spring Wheat were also 13.5%, 12.5% and 11.5%.

The procedures for the segregation of wheat by protein content, including both the management and monitoring of the system, have remained essentially the same as those developed during the 1971-72 crop year. The segregation system continues to rely upon the co-ordinated efforts of several sections of the Canadian Grain Commission and the Canadian Wheat Board.

The operation of the system during 1972-73 was very successful, as evidenced by the satisfaction of our customers as well as by statistical measures of performance. The general standard of deviation of the average protein content of cargoes about the overall average for the highest volume guaranteed level was reduced to 0.14% during 1972-73 from the 0.16% experienced during 1971-72 which indicates that slightly less variability existed within protein levels. The greater uniformity permitted a small reduction in the margin of safety required over the guaranteed protein levels to allow for sampling and analytical errors and this enabled a greater volume of wheat to enter the higher subgrade.

The Canadian Wheat Board and the Canadian Grain Commission have also co-operated in the design and conduct of experimental wheat harvest surveys for 1973 with the objective of improving the timeliness, accuracy and completeness of estimates of new crop protein content and grade quality. Successful survey should aid in the marketing and the planning of transportation to meet sales commitments of the guaranteed protein levels of wheat.

The Commission continued and expanded its research and testing program towards the development of further equipment capable of establishing levels under the operational conditions prevailing in a grain elevator. Testing devices were established at nine selected primary elevators and samples of wheat delivered to the elevator were tested for protein content. The experiments indicated that the time required and the accuracy of testing, combined with operational restraints within the elevators, would prevent the successful segregation of wheat by protein content at primary elevators in the near future. Other protein testing devices utilizing the principle of infrared reflectance spectroscopy have been tested under operational conditions at terminal elevators at Thunder Bay for the purpose of determining the accuracy and speed of the testing procedures. Initial results have proved encouraging and this program will be extended over the next two years to test the accuracy and operational performance of these grain quality analyzers at each terminal elevator.

Entomology Services. The regional entomology laboratories at Thunder Bay, Ont., and North Vancouver, B.C., are responsible for monitoring sanitation and insect control within the export terminals by carrying out a regular systematic examination of each terminal. Some 39,200 grain samples from 29 terminals involving 161 inspections were monitored for infestation and detailed results supplied to each firm and the Plant Protection Division for certification purposes. Control measures appropriate to the problem were prescribed and re-examination made following treatment. The incidence of primary infestation continued to remain low and *Cryptolestes ferrugineus* was the major primary insect intercepted. The Thunder Bay laboratory, which was established in April 1972, completed its first crop year and the infestation level in terminals for the two regions can now be compared. No significant difference was found in the primary infestation. Some difference was seen in respect to secondary insects and these higher population levels can be directly related to the degree of structural sanitation influenced by volume movement and availability of manpower. More general use of pesticides and power equipment has noticeably reduced secondary insect counts, and it is anticipated that further decreases will take place with the continuation of entomological services supplied to the industry.

Headquarters staff conducted annual inspection of inland terminals and of transfer elevators in Ontario, Quebec and the Maritime Provinces. A total of 4,274 identified samples were monitored from these sources. Cut-off samples totaling 3,251 were received from seven major grain companies in Western Canada. Results and treatment advice were given to each firm. A low level of primary infestation was noted. Initial plans were well under way in 1973 in establishing an entomology laboratory at Chatham, Ont., to serve the licensed transfer elevators of Ontario.

Monitoring Moisture Meter Performance. The Grain Inspection Division in its offices across Canada uses the Model 919 Moisture Meter for the determination of moisture content in cereal grains and oil seeds. This equipment includes 130 meters equipped with 3-inch cell for use with small-seeded grains and 28 meters equipped with 3½-inch cell for use with large-seeded grains. The performance of each of these meters is monitored by the Commission's Research Laboratory by means of biweekly check samples. As required, meters are brought in from Inspection offices to be serviced and recalibrated in the Winnipeg Laboratory.

During the year, moisture testing equipment and facilities in all major Inspection offices across Canada were inspected and checked. The Research Laboratory completed a review of the calibration of the Model 919 meter for the determination of moisture content in corn over the moisture range 20 to 30%. As a result of increasing farmer interest in possible alternative crops, the Commission's Research Laboratory did some preliminary calibration studies of the determination of moisture content in faba beans using the Model 919 moisture meter.

Grain Appeal Tribunal. During the crop year 1972-73, a total of 406 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of cars officially inspected in the Western Division. The grades assigned by the Inspection Division were sustained in 344 cases. Most of the samples reviewed by the Tribunal represented carlot shipments of either wheat or barley, and covered a wide range of varieties and grades.

Grading Services to Producers. At 36,439, the total number of "Subject to Grade and Dockage" and other unofficial samples inspected for producers

and the trade showed a marked increase from the 33,944 inspected for 1971-72. Oilseed samples continued to be a major portion of samples inspected. Producers' complaints on special bin barley carlot shipments totaled 30. The Chief Grain Inspector's comparisons of primary delivery samples with final unload samples established that in three cases the identity of the producer's grain had not been preserved in handling through the primary elevator.

Service to Other Organizations. The Economics and Statistics Division functioned as a statistical support agency for the Canadian Wheat Board, by supplying them with all major reports and publications compiled by the Division, particularly those related to country elevator operations and the positioning of grain stocks.

The Division served as the prime source of grain handling statistics pertaining to the licensed elevator system for incorporation in a variety of statistical releases by Statistics Canada. In particular, this office supplied the Agricultural Division of Statistics Canada with the primary material for the joint annual publication, *Grain Trade of Canada*.

Special Acts Administration. The Commission did not find it necessary to establish any maximum freight rates under the provisions of the Inland Water Freight Rates Act.

SECTION 4 — PERSONNEL ADMINISTRATION

During 1973 personnel services relating to Canadian Grain Commission staff were transferred from the Commission's Executive Division to the Personnel Administration Branch of Agriculture Canada.

Assistant Commissioners appointed were Mr. G. R. Cobbe at Winnipeg, Mr. J. B. Hooker at Saskatoon, and Mr. R. Clark at Harrow, Ont. Other appointments to senior positions on the staff were Mr. C. W. Hammond, Chief Grain Inspector, Mr. L. C. Rayner, Director of the Economics and Statistics Division, Mr. J. S. T. Swanson, Director of the Weighing Division, and Mr. R. A. Kullman, Financial Officer.

Senior retirements during the year were Mr. M. M. Ainslie, Chief Grain Inspector, and Mr. W. S. Rowland, Financial Officer.

At December 31, 1973, total staff exclusive of the Canadian Government Elevators, was 905 compared with 882 at the end of 1972. The staff of the Canadian Government Elevators totaled 205, a reduction of 30 since December 31, 1972.

During the year, 25 employees received certificates in recognition of 25 years' service in the Public Service of Canada.

APPENDIX A

Grain Statistics and Quality

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A-1—Supply and Disposition of Canadian Grains, Crop Year 1972-73

	Wheat*	Oats	Barley	Rye	Flaxseed	Rapeseed	Total
— thousands of bushels —							
SUPPLY							
Carry-over July 31, 1972**	583,757	118,257	175,843	15,796	16,032	43,139	952,824
Production in 1972	533,288	300,208	518,316	13,524	17,617	57,300	1,440,253
Imports	—	—	—	—	3	—	3
Total supply	1,117,045	418,465	694,159	29,320	33,652	100,439	2,393,080
DISPOSITION							
Exports***	576,594	6,925	165,248	8,236	20,819	54,056	831,878
Consumed in Canada	175,050	331,861	335,887	10,780	5,160	25,705	884,443
Total Disposition	751,644	338,786	501,135	19,016	25,979	79,761	1,716,321
CARRY-OVER (JULY 31, 1973)							
On farms (estimated)	115,000	65,000	88,000	1,600	600	400	270,600
In primary, process and Terminal elevators	185,107	10,759	91,670	7,465	5,956	16,164	317,121
In store at and afloat to eastern transfer elevators	38,541	2,167	6,410	311	215	8	47,652
In eastern and western mill bins	3,770	148	1	1	—	—	3,920
In transit by rail—Eastern and Western divisions	22,983	1,605	6,943	927	902	4,106	37,466
In store and in transit to the United States	—	—	—	—	—	—	—
Total in store July 31, 1973	365,401	79,679	193,024	10,304	7,673	20,678	676,759

* Wheat includes durum wheat.

** Revised.

*** Includes 23,351,562 bushels of wheat in wheat flour form, 421,590 bushels of seed wheat, 38,432 bushels of oats in rolled oats and oatmeal form, 169,012 bushels of seed oats, 8,413,114 bushels of barley in barley malt form and 1,178,980 bushels of flaxseed in linseed oil form.

A-2—Licences in Force and Storage Capacity, August 1, 1973 and 1972

Type of licence	Licences in force August 1		Licensed storage capacity August 1	
	1973	1972	1973	1972
Primary elevator	4,383	4,567	368,026,900	377,798,550
Terminal and process elevator	57	56	167,858,210	166,793,710
Transfer elevator	28	28	124,991,300	128,486,300
Grain dealer	17	16	*	*
Total	4,485	4,667	660,876,410	673,078,560

* These licences do not cover storage facilities.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1972-73

Grade	Carlots	%	% of total wheat inspected
WHEAT			
1 Canada Western Red Spring	170,578	65.1	—
Tough 1 Canada Western Red Spring	1,755	.7	—
2 Canada Western Red Spring	43,556	16.6	—
Tough 2 Canada Western Red Spring	7,719	2.9	—
3 Canada Western Red Spring	22,168	8.5	—
Tough 3 Canada Western Red Spring	11,208	4.3	—
1 Canada Utility	66	*	—
2 Canada Utility	14	*	—
3 Canada Utility	1,713	.7	—
Tough Others	2,780	1.1	—
Damp	303	.1	—
Rejected	48	*	—
Others red spring	—	—	—
Total red spring wheat	261,908	100.0	88.1
1 Canada Western Amber Durum	2,126	6.6	—
2 Canada Western Amber Durum	9,981	30.8	—
3 Canada Western Amber Durum	10,065	31.1	—
Extra 4 Canada Western Amber Durum	5,175	16.0	—
4 Canada Amber Durum	3,597	11.1	—
5 Canada Western Amber Durum	448	1.4	—
6 Canada Western Amber Durum	—	—	—
Tough durum	703	2.2	—
Others durum	255	.8	—
Total amber durum wheat	32,350	100.0	10.9
Total soft white spring	1,092	—	.4
Total mixed wheat	131	—	*
Total Alberta winter wheat	1,814	—	.6
Total all wheats	297,295	—	100.0

* Less than 0.05%.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1972-73 (Continued)

Grade	Carlots	%
OATS		
1 Canada Western.	—	—
2 Canada Western.	27	.2
Extra 3 Canada Western.	164	1.4
3 Canada Western.	2,768	24.3
Extra 1 Feed.	1,984	17.4
1 Feed.	5,581	48.9
2 Feed.	545	4.8
3 Feed.	106	.9
Mixed Feed.	60	.5
Tough.89	.8
Damp.	1	*
Rejected.	32	.3
Others.	54	.5
Total oats.	11,411	100.0
BARLEY		
1 Canada Western Six-Row.	1	*
2 Canada Western Six-Row.	271	.3
3 Canada Western Six-Row.	9,151	10.8
1 Canada Western Two-Row.	—	—
2 Canada Western Two-Row.	195	.2
3 Canada Western Two-Row.	6,776	8.0
1 Feed.	55,594	65.4
2 Feed.	4,530	5.3
3 Feed.	417	.5
Tough.	7,808	9.2
Damp.	172	.2
Rejected.	59	.1
Others.	21	*
Total barley.	84,995	100.0

* Less than 0.05%.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1972-73 (Continued)

Grade	Carlots	%
RYE		
1 Canada Western.	11	*
2 Canada Western.	2,447	50.0
3 Canada Western.	2,199	45.0
4 Canada Western.	86	1.8
Ergoty.	66	1.4
Tough.	73	1.5
Damp.	1	*
Rejected.	17	.3
Others.	1	*
Total rye	4,901	100.0
FLAXSEED		
1 Canada Western.	10,497	95.7
2 Canada Western.	188	1.7
3 Canada Western.	74	.7
4 Canada Western.	5	*
Tough.	170	1.6
Damp.	3	*
Rejected.	20	.2
Others.	15	.1
Total flaxseed	10,972	100.0
RAPESEED		
1 Canada.	24,493	91.0
2 Canada.	661	2.5
3 Canada.	347	1.3
Others.	1,411	5.2
Total rapeseed	26,912	100.0

* Less than 0.05%.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1972-73 (Concluded)

Grade	Carlots	%
OTHER GRAINS		
Corn	32	—
Sunflower seed	932	—
Mixed grain	121	—
Screenings	283	—
Buckwheat	524	—
Soybeans	1	—
Peas	347	—
Sample grain	24	—
Safflower seed	1	—
Mustard seed	654	—
Condemned grain	8	—
	2,927	—
Grand total	439,413	—

A-4—Samples of Western Grain “Subject to Grade and Dockage” and Other Unofficial Samples Inspected, Crop Year 1972-73, Compared with Crop Year 1971-72

Point	1972-73	1971-72
	Number of samples	
Winnipeg	17,055	13,826
Calgary	6,228	6,676
Edmonton	375	530
Moose Jaw	5	2
Saskatoon	2,108	565
Lethbridge	11,668	12,345
Total	37,439	33,944

A-5—Inward Carlot and Trucklot Reinspections of Western Grain, Crop Year 1972-73

Point	Inspected	Re-inspected	Un-changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	247,607	12,332	11,127	1,019	47	19	120
Winnipeg	6,468	664	548	95	12	—	9
Churchill	11,936	353	346	4	1	—	2
Moose Jaw	3,166	224	174	50	—	—	—
Saskatoon	6,793	227	197	20	2	5	3
Calgary	5,412	180	165	13	1	—	1
Edmonton	2,386	212	202	10	—	—	—
Medicine Hat	—	—	—	—	—	—	—
Lethbridge	307	2	2	—	—	—	—
Prince Rupert	15,022	880	755	124	—	—	1
Vancouver	149,399	6,991	6,353	544	8	21	65
Total	448,496	22,065	19,869	1,879	71	45	201
% of total carlots and trucklots	100.0	4.9	4.4	.4	*	*	*

* Less than 0.05%.

A-6—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1972-73

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	222	2,202	66	10	1,238
Oats	192	3,822	1	31	—
Barley	185	5,442	463	—	450
Flaxseed	3	169	276	234	195
Rye	—	72	—	—	1
Mixed grain	2	10	10	7	—
Corn	—	—	—	—	—
Buckwheat	1	12	14	—	—
Peas	6	—	—	—	—
Screenings	140	5,966	101	189	49
Rapeseed	—	32	425	844	—
Sample feed grain	9	—	—	—	—
Mustard seed	—	4	31	16	89
Sample grain	29	138	2	19	—
Sunflower	—	—	—	—	4
Total	789	17,868	1,389	1,350	2,026

Grain	Saskatoon	Lethbridge	Vancouver, Victoria and Prince Rupert	Churchill
Wheat	557	—	575	—
Oats	34	1	782	—
Barley	1,146	—	791	—
Flaxseed	14	31	15	—
Rye	—	—	4	—
Mixed grain	1	—	56	—
Corn	—	—	5	—
Buckwheat	—	1	3	—
Peas	—	—	—	—
Screenings	285	2	1,599	—
Rapeseed	903	—	23	—
Sample feed grain	1	—	5	—
Mustard seed	137	39	16	—
Sample grain	5	—	44	—
Canary seed	34	—	—	—
Sunflower	—	3	—	—
Total	3,117	77	3,918	—

A-7—Carlot Inspections of Eastern Grain, Crop Year 1972-73

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
1 Canada Eastern White Winter	—	—	40	40
2 Canada Eastern White Winter	89	4	931	1,024
3 Canada Eastern White Winter	5	—	182	187
4 Canada Eastern White Winter	3	—	16	19
5 Canada Eastern White Winter	—	—	9	9
2 Canada Eastern Mixed Winter	—	—	4	4
3 Canada Eastern Mixed Winter	—	—	1	1
Tough	8	—	160	168
Damp	—	—	2	2
Sample	—	—	15	15
Total	105	4	1,360	1,469
BARLEY				
4 Canada Eastern	1	—	4	5
Total	1	—	4	5
BUCKWHEAT				
1 Canada Eastern	—	—	1	1
Sample	—	—	1	1
Total	—	—	2	2

**A-7—Carlot Inspections of Eastern Grain, Crop Year 1972-73
(Continued)**

Grade	Montreal	Toronto	Chatham	Total
CORN				
1 Canada Eastern Yellow Extra Dry.	—	—	155	155
1 Canada Eastern Yellow	—	—	247	247
2 Canada Eastern Yellow Extra Dry.	—	—	69	69
2 Canada Eastern Yellow	—	—	116	116
3 Canada Eastern Yellow Extra Dry.	—	—	73	73
3 Canada Eastern Yellow	—	—	163	163
4 Canada Eastern Yellow Extra Dry.	2	—	26	28
4 Canada Eastern Yellow	—	—	46	46
5 Canada Eastern Yellow Extra Dry.	—	—	12	12
5 Canada Eastern Yellow	—	—	12	12
Tough	2	—	27	29
Damp	—	—	1	1
Moist	—	—	2	2
Wet	—	—	1	1
Sample	1	—	10	11
Total	5	—	960	965
BEANS				
1 Canada Eastern Pea	—	—	44	44
2 Canada Eastern Pea	—	—	4	4
3 Canada Eastern Pea	—	—	30	30
Damp	—	—	1	1
Total	—	—	79	79

**A-7—Carlot Inspections of Eastern Grain, Crop Year 1972-73
(Concluded)**

Grade	Montreal	Toronto	Chatham	Total
SOYBEANS				
1 Canada Yellow	—	—	242	242
2 Canada Yellow	—	—	226	226
3 Canada Yellow	—	1	30	31
4 Canada Yellow	—	—	3	3
Tough	—	—	240	240
Damp	—	1	21	22
Moist	—	—	18	18
Wet	—	—	41	41
Sample	—	—	1	1
Total	—	2	822	824
Total, all grains.	111	6	3,227	3,344

**A-8—Inspections of Eastern Grain in Cargoes, Bins, Trucks or
Warehouses, Crop Year 1972-73**

Grain	Montreal	Toronto	Chatham	Total
		— bushels —		
Wheat	73,212	—	8,087,107	8,160,319
Barley	—	4,294	—	4,294
Corn	—	—	1,491,248	1,491,248
Beans	—	—	2,045,559	2,045,559
Soybeans	—	1,907	1,577,565	1,579,472
Total	73,212	6,201	13,201,479	13,280,892

**A-9-Inward and Export Cargoes Sampled and Inspected,
Crop Year 1972-73**

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Bate Comeau	Port Cartier	Total
				— bushels —				
Eastern grain								
Inward	—	—	—	—	—	—	—	—
Export	—	—	—	—	—	374,192	1,312,628	1,686,820
Western grain								
Inward	—	—	—	—	—	—	—	—
Export	76,183,696	29,512,381	32,941,277	44,268,091	35,144,613	75,448,098	69,614,694	363,112,850
Total	76,183,696	29,512,381	32,941,277	44,268,091	35,144,613	75,822,290	70,927,322	364,799,670

A-10-Grain Sampled but not Inspected, Crop Year 1972-73

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern grain							
Carlots	3	—	—	—	—	—	3
Inward cargoes, bu	1,420,695	—	—	—	—	—	1,420,695
Outward cargoes, bu.	—	—	—	—	—	—	—
Bin lots, bu	109,776	275,200	—	—	—	—	384,976
Western grain							
Carlots	21	—	—	—	—	—	21
Inward cargoes, bu.	12,352,451	—	—	—	—	—	12,352,451
Outward cargoes, bu.	—	—	—	—	—	—	—
Bin lots, bu	165,421	—	—	—	—	—	165,421
U.S.A. grain							
Carlots	13	—	—	—	—	—	13
Inward cargoes, bu	9,672,868	100,000	380,197	—	—	51,161	10,204,226
Outward cargoes, bu.	1,513,999	—	18,992,727	—	33,499,606	27,537,351	81,543,683
Bin lots, bu	280,033	—	—	—	—	—	280,033
Total—cars	37	—	—	—	—	—	37
bushels	25,515,243	375,200	19,372,924	—	33,499,606	27,588,512	106,351,485

A-11—Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1972-73

Point	Wheat	Durum	Oats	Barley	Rye
RECEIPTS					
			— bushels —		
Thunder Bay	294,367,348	54,230,287	32,655,436	128,895,737	3,961,568
Vancouver	200,052,282	15,155,569	109,697	50,027,684	6,827,372
Victoria	9,832,014	—	322	—	—
Prince Rupert	31,082,882	1,660	—	1,874	—
Churchill	15,613,835	—	—	9,000,263	—
Calgary	277,459	14,911	—	2,084,945	—
Edmonton	301,921	6,554	5,243	22,188	—
Lethbridge	34,528	—	—	19,221	—
Moose Jaw	31,208	1,150,792	—	12,924	1,952
Saskatoon	101,177	20,771	121,244	2,644,551	2,125
Total	551,694,654	70,580,544	32,891,942	192,709,387	10,793,017
SHIPMENTS					
			— bushels —		
Thunder Bay	288,844,743	52,423,323	38,004,966	130,737,144	2,819,486
Vancouver	194,472,418	15,424,631	2,898,060	49,770,833	6,502,617
Victoria	9,900,957	—	163,795	1,208	—
Prince Rupert	29,541,160	1,610	330,922	1,874	—
Churchill	16,278,825	—	200,148	8,855,862	—
Calgary	315,328	12,573	5,029	2,187,839	—
Edmonton	328,349	5,918	125,069	23,141	—
Lethbridge	11,408	—	2,373	—	—
Moose Jaw	2,072,745	1,809,036	—	1,286,652	3,996
Saskatoon	945,080	14,408	30,678	2,519,000	2,119
Total	542,711,013	69,691,499	41,761,040	195,383,553	9,328,218

**A-11—Quantities of Grain Inspected and Weighed at Terminal Elevators,
Crop Year 1972-73—Continued**

Point	Flaxseed	Rapeseed	Buckwheat	Mustard Seed	Peas	Miscel- laneous
RECEIPTS						
			— bushels —			
Thunder Bay	14,351,052	19,306,062	172,613	1,013,157	485,750	1,814,314
Vancouver	7,774,733	39,640,597	1,033,112	284,014	—	758,055
Victoria	—	—	—	—	—	—
Prince Rupert	—	—	—	—	—	—
Churchill	—	—	—	—	—	—
Calgary	603,798	1,212,065	31,498	20,857	—	778
Edmonton	799,212	2,798,964	—	26,270	—	2,307
Lethbridge	25,979	—	1,163	8,090	—	6,411
Moose Jaw	343,541	—	—	241,763	—	9,156
Saskatoon	22,172	1,106,703	—	309,817	—	665
Total	23,920,487	64,064,391	1,238,386	1,903,968	485,750	2,591,686
SHIPMENTS						
			— bushels —			
Thunder Bay	13,772,590	17,512,945	170,440	1,026,586	552,611	1,897,964
Vancouver	7,517,695	36,468,355	1,104,309	273,753	—	770,989
Victoria	—	—	—	—	—	19,460
Prince Rupert	—	—	—	—	—	45,029
Churchill	—	—	—	—	—	—
Calgary	647,601	1,210,430	32,372	70,097	—	2,969
Edmonton	630,276	2,585,838	—	43,092	—	4,000
Lethbridge	60,977	330	1,155	36,734	—	15,065
Moose Jaw	422,257	—	—	255,382	—	8,103
Saskatoon	23,544	1,096,183	—	414,592	—	5,250
Total	23,074,940	58,874,081	1,308,276	2,120,236	552,611	2,768,829

**A-12—Carlots Weighed, Leaking or with Defective Seals, in
the Western Division
Crop years 1971-72 and 1972-73**

	Number		% of total	
	1972-73	1971-72	1972-73	1971-72
Cars weighed in	458,019	461,473	100.0	100.0
Inward leaks	32,054	49,666	7.0	10.8
Inward seals missing or defective	25,485	22,356	5.6	4.8
Cars weighed out	21,747	26,166	—	—

**A-13—Average Reported Outturn Shortage on Vessel Shipments of Grain from
Thunder Bay to Licensed Transfer Elevators, Crop Year 1972-73**

Grain	Bushels Shipped	Shortage in pounds per 1,000 bushels	
		1972-73	1971-72
Wheat	274,791,837	41.94	37.09
Durum wheat	49,775,435	39.67	56.96
Oats	23,644,351	23.96	39.04
Barley	98,995,148	38.26	39.22
Rye	995,182	43.76	117.64
Flaxseed	1,919,947	22.96	87.45
Rapeseed	3,816,650	44.83	—
Screenings (tons)	105,786	2.11 ton	2.67 ton

A-14—Tough and Damp Grain Dried at Terminal Elevators, Crop Year 1972-73

	Artificial drying				
	Tough	Damp	Total	Natural drying	Total
— bushels —					
Thunder Bay					
Wheat	10,345,102	271,908	10,617,010	11,566,079	22,183,089
Durum	7,552	2,159	9,711	782,800	792,511
Oats	—	—	—	442,691	442,691
Barley	623,807	138,547	762,354	7,763,825	8,526,179
Rye	—	—	—	21,511	21,511
Flaxseed	49,367	8,427	57,794	213,267	271,061
Rapeseed	7,818	—	7,818	10,552	18,370
Buckwheat	—	—	—	2,047	2,047
Sunflower seed*	2,301	4,205	6,506	18,048	24,554
Total	11,035,947	425,246	11,461,193	20,820,820	32,282,013
Pacific Coast					
Wheat	6,775,998	278,217	7,054,215	7,104,932	14,159,147
Durum	—	—	—	35,199	35,199
Oats	—	—	—	—	—
Barley	5,438,805	244,680	5,683,485	2,741,483	8,424,968
Rye	17,782	4,396	22,178	67,716	89,894
Flaxseed	—	—	—	21,844	21,844
Rapeseed	—	—	—	20,871	20,871
Buckwheat	2,488	—	2,488	13,133	15,621
Sunflower seed*	—	—	—	44,309	44,309
Total	12,235,073	527,293	12,762,366	10,049,487	22,811,853
Interiors					
Wheat	—	15,213	15,213	—	15,213
Durum	—	—	—	7,802	7,802
Barley	—	—	—	41,543	41,543
Flaxseed	—	—	—	32,607	32,607
Rapeseed	—	—	—	300	300
Mustard seed	15,398	—	15,398	9,950	25,348
Sunflower seed*	7,205	—	7,205	—	7,205
Total	22,603	15,213	37,816	92,202	130,018
Churchill					
Wheat	—	—	—	7,109	7,109
Barley	—	—	—	41,401	41,401
Total	—	—	—	48,510	48,510
Total, all locations	23,293,623	967,752	24,261,375	31,011,019	55,272,394

(*) 30 pounds/bushel.

A-15—Quality Data for Grades of Red Spring Wheat Marketed, Crop Year 1972-73

	1 C.W. Red Spring Wheat				
	14.5	14	13.5	12.5	11.5
Test weight, Avery, lb/bu.	65.8	65.8	66.6	67.1	66.7
1000-kernel weight, g	29.1	28.5	29.1	30.2	31.0
Wheat protein content, % *	15.0	14.5	13.9	12.7	11.5
Flour protein content, % **	14.1	13.6	13.0	12.0	10.7
Flour yield, %	73.5	75.1	75.7	75.7	75.0
Flour ash content, %	0.45	0.45	0.46	0.46	0.47
Flour diastatic activity, mg.	172	166	180	201	214
Baking absorption, %	63.0	62.0	61.0	61.0	60.0
Loaf volume, cc.	910	900	870	770	670

	2 C.W. Red Spring Wheat			3 C.W. Red Spring Wheat
	13.5	12.5	11.5	
Test weight, Avery, lb/bu.	65.1	65.8	65.7	63.3
1000-kernel weight, g	28.9	30.3	31.0	29.7
Wheat protein content, % *	13.9	12.9	11.6	12.9
Flour protein content, % **	13.1	11.9	10.7	12.0
Flour yield, %	75.1	75.3	76.0	74.2
Flour ash content, %	0.46	0.46	0.49	0.50
Flour diastatic activity, mg.	180	188	203	239
Baking absorption, %	61.0	60.0	59.0	61.0
Loaf volume, cc.	880	775	695	745

(*) 13.5% moisture basis.

(**) 14.0% moisture basis.

A-16—Carlot Inspections Appealed, Crop Year 1972-73

Item	Carlots	%
Left as graded	344	84.7
Grades raised	62	15.3
Grades lowered	—	—
Total	406	100.0

**A-17—Weighted Average Lake Freight Rates on Canadian Grain from
Thunder Bay, Season of Navigation 1973**

Port of discharge	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed
	— cents per bushel —					
Georgian Bay Ports, Goderich Sarnia and Walkerville	6.355	6.432	6.461	8.258	—	—
Port Colborne	7.674	7.641	7.964	8.5	—	—
Toronto	9.448	8.939	9.168	11.5	10.07	—
Kingston	7.0	—	11.0	—	—	—
Prescott	9.326	7.893	9.077	—	—	—
Montreal	9.59	7.955	8.95	10.02	—	—
Sorel	9.517	7.75	9.121	10.0	—	—
Three Rivers	9.525	8.321	9.24	—	—	—
Quebec	9.522	7.908	8.899	9.5	11.632	11.506
Baie Comeau	9.524	—	8.768	9.711	—	9.922
Port Cartier	9.556	—	8.75	—	—	—
Halifax	17.348	—	16.94	—	—	—
Other Maritimes	29.113	28.0	20.261	—	—	—
Buffalo	—	—	12.344	—	—	—
Manitowoc	—	—	9.773	—	—	—
Milwaukee	—	—	10.44	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

Schedule D was amended, effective April 15, 1973, to increase the maximum rate for storage of grain at licensed transfer elevators from 1/30c to 1/25c per bushel per day.

Amendments, effective August 1, 1973, were made as follows:

Section 6, in regard to taking of official samples of grain.

Section 59, in regard to mixing of different grades of Red Spring Wheat at terminal elevators.

Schedule E, in regard to equipment for dockage testing of Sunflower Seed, Rapeseed and Mustard Seed.

Schedule L, by deleting the grades "Recleaned Oats (Western)" and "Recleaned Barley (Western)."

Section 75, in regard to calculation of shrinkage adjustment on grain dried at terminal elevators.

Section 65 was amended on December 18, 1973, to provide a revised basis for determination of excessive grain overages at licensed terminal and transfer elevators.

Schedule C was amended, effective January 1, 1974, to increase the maximum additional charge for loading grain to railway cars at licensed terminal elevators from ½c per bushel to 1 ½c per bushel.

Western Grain Standards Committee as at December 31, 1973

H. D. Pound C. W. Hammond Dr. G. N. Irvine (Vacant)	Chief Commissioner Chief Grain Inspector Chief Chemist Chairman, Grain Appeal Tribunal	} Canadian Grain Commission
Dr. J. W. Morrison J. B. Russell	} representing the Canada Department of Agriculture	
C. W. Gibbings	representing the Canadian Wheat Board	
N. H. McClure W. W. Sisler	} representing processors of grain	
G. E. Gould R. K. Lester	} representing exporters of grain	
John I. Miller R. E. Hadland Hubert N. Anderson H. R. Patching Elmer Kure Gordon South Devone R. Clark Avery K. Sahl Frank Dietz D. E. Campbell Wm. A. Ronald A. Bos	} representing producers of western grain	
* H. K. Moen	additional	

(*) Appointed pursuant to Section 17 (2) (h) to provide additional expertise on Committee.

Eastern Grain Standards Committee as at December 31, 1973

H. D. Pound C. W. Hammond Dr. G. N. Irvine	Chief Commissioner Chief Grain Inspector Chief Chemist	} Canadian Grain Commission
Dr. J. W. Morrison	representing the Canada Department of Agriculture	
C. F. Bowker F. J. Reid B. Giard M. Pardo	} representing processors and exporters of grain	
M. R. McDougall Clarence Wilson Gus Sonneveld Kenneth Patterson	} representing producers of eastern grain	
Fernand Beaudet E. M. Jones G. C. Nichols	} additional*	

(*) Appointed pursuant to Section 17 (3) (e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Red Spring Wheat.</i> Crop Bulletin	Annually
<i>Canadian Amber Durum Wheat.</i> Crop Bulletin	Annually
<i>Canadian Barley.</i> Crop Bulletin	Annually
<i>Canadian Flax and Rapeseed.</i> Crop Bulletin	Annually
<i>Canadian Wheat Cargoes.</i> Bulletin	Quarterly
<i>Canadian Durum Cargoes.</i> Bulletin	Quarterly
<i>Map of Western Canada Showing the Protein Content of Hard Red Spring Wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Grain Grading Handbook for Western Canada</i>	
<i>Varietal Identification of Barley, Wheat and Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain through a Primary Elevator</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1973 Annual Report.

APPENDIX D

Revenue and Expenditure

Earned revenue and net expenditure of the Commission, including the Canadian Government Elevators, for the fiscal year 1972-73, compared with 1971-72, were as follows:

	1972-73	1971-72
Revenue	\$11,644,057	\$ 9,446,312
Expenditure	15,141,772	13,055,687

Further information is given in the following tables.

D-1—Earned Revenue and Net Expenditure, by Points and Divisions, Fiscal Year Ended March 31, 1973

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
				— dollars —			
Winnipeg*	970	68,712	44,879	220,996	90	4,227,482	4,563,129
Churchill	—	110,091	59,052	—	—	—	169,143
Saskatoon	—	45,556	43,958	—	—	—	89,514
Moose Jaw	—	13,070	6,453	—	—	—	19,523
Medicine Hat	—	(939)	(469)	—	—	—	(1,408)
Lethbridge	—	16,865	296	—	—	—	17,161
Calgary	—	26,543	40,326	—	—	—	66,869
Edmonton	—	14,052	4,900	—	—	—	18,952
Vancouver	—	1,400,983	716,168	103,450	—	—	2,220,601
Victoria	—	51,770	25,286	—	—	—	77,056
Prince Rupert	—	112,352	56,262	—	—	—	168,614
Thunder Bay	—	2,669,116	1,365,517	—	—	—	4,034,633
Toronto	—	18,813	—	—	—	—	18,813
Chatham	—	108,911	—	—	—	—	108,911
Montreal	—	14,107	—	27,197	—	—	41,304
Baie Comeau	—	7,059	16,611	—	—	—	23,670
Port Cartier	—	3,003	2,263	—	—	—	5,266
Quebec	—	2,306	—	—	—	—	2,306
Total	970	4,682,370	2,381,502	351,643	90	4,227,482	11,644,057
EXPENDITURE							
				— dollars —			
Winnipeg*	502,290	1,238,322	234,302	556,690	1,335,262	3,671,053	7,537,919
Churchill	—	31,877	12,189	—	—	—	44,066
Saskatoon	15,097	102,962	53,407	—	—	—	171,466
Moose Jaw	—	33,546	—	—	—	—	33,546
Regina	29,214	—	—	—	—	—	29,214
Medicine Hat	—	—	7,868	—	—	—	7,868
Lethbridge	—	32,894	—	—	—	—	32,894
Calgary	33,824	325,676	52,839	—	—	—	412,339
Edmonton	—	51,330	—	—	—	—	51,330
Vancouver	—	925,443	701,454	209,848	—	—	1,836,745
Victoria	—	46,292	35,120	—	—	—	81,412
Prince Rupert	—	70,314	57,124	—	—	—	127,438
Thunder Bay	—	2,317,654	1,510,953	227,455	—	—	4,056,062
Toronto	—	21,905	—	—	—	—	21,905
Chatham	—	125,861	—	—	—	—	125,861
Montreal	—	390,552	20,439	35,152	—	—	446,143
Baie Comeau	—	41,239	16,175	—	—	—	57,414
Port Cartier	—	36,557	—	—	—	—	36,557
Quebec	—	31,593	—	—	—	—	31,593
Total	580,425	5,824,017	2,701,870	1,029,145	1,335,262	3,671,053	15,141,772

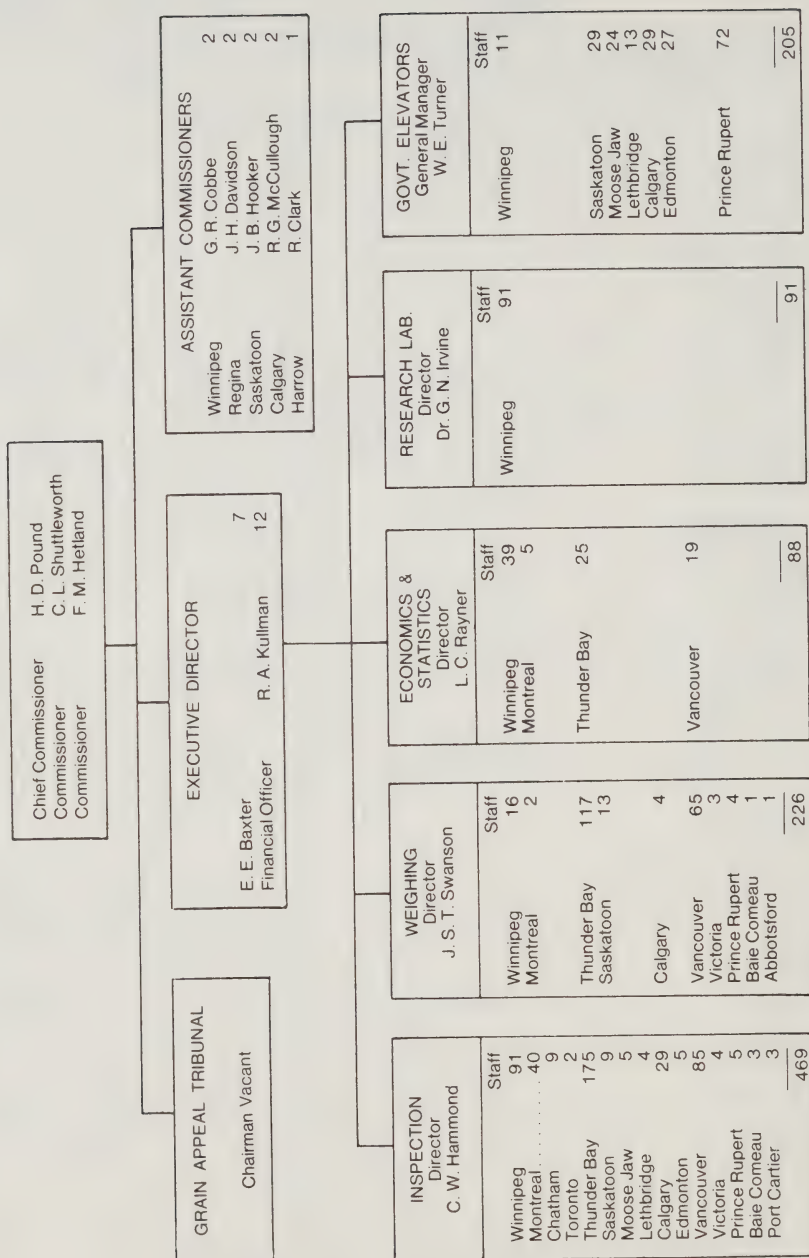
Note: * Revenue and expenditure for all Canadian Government Elevators shown opposite Winnipeg.

**D-2—Summary of Operations by Divisions, Fiscal Year Ended
March 31, 1973**

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
	— dollars —						
Fees	— 4,634,293	2,363,209	351,643	—	—	—	7,349,145
Overtime	— 24,475	18,293	—	—	—	—	42,768
Express charges	— 3,068	—	—	—	—	—	3,068
Samples sold	— 18,843	—	—	—	—	—	18,843
Refund of previous year's expenditures	115	1,691	—	—	40	—	1,846
Miscellaneous	85	—	—	—	50	—	905
Grain handling charges	—	—	—	—	—	4,227,482	4,227,482
Total	970 4,682,370	2,381,502	351,643	90	4,227,482	11,644,057	
EXPENDITURE							
Personnel costs	381,895	4,903,451	2,581,478	737,503	751,333	1,970,202	11,325,862
Travel	44,523	141,571	76,483	11,620	18,790	17,990	310,977
Postage, freight and cartage	7,500	150,415	2,195	10,914	13,048	5,270	189,342
Telephone and telegraph	8,930	46,290	8,795	25,691	3,600	25,112	118,418
Advertising	5,500	—	—	—	—	32	5,532
Departmental publications	2,699	5	—	9,807	10,701	—	23,212
Professional and special services	26,879	5,113	566	2,026	4,536	18,056	57,176
Rentals—buildings	30,745	114,410	13,661	59,100	73,514	5,174	296,604
—equipment	2,122	3,422	432	106,132	4,206	3,271	119,585
Purchase repair and upkeep							
—buildings and works ..	—	3,176	—	—	—	101,132	104,308
—equipment	889	5,779	156	1,697	6,711	6,875	22,107
Utilities	1,284	10,007	959	5,689	12,509	196,114	226,562
Grants in lieu of taxes	—	—	—	—	—	453,358	453,358
Screenings	—	—	—	—	—	148,164	148,164
Printing and stationery	7,257	48,256	5,264	25,845	12,798	5,214	104,634
Other materials and supplies	1,912	95,692	1,356	2,067	63,245	69,399	233,671
Grants and Contributions	—	—	—	—	742	—	742
Construction/ acquisition bldgs.	—	44,732	—	—	—	—	44,732
Office equipment	58,169	36,062	9,616	31,054	57,409	5,793	198,103
Other capital equipment	121	215,636	909	—	302,120	639,897	1,158,683
Total	580,425	5,824,017	2,701,870	1,029,145	1,335,262	3,671,053	15,141,772

APPENDIX E

CANADIAN GRAIN COMMISSION



December 31, 1973

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Government
Publications

Report of the

CANADIAN GRAIN COMMISSION 1974



AGRICULTURE
CANADA

Minister
Hon. Eugene Whelan

Deputy Minister
S. B. Williams

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Report of the

**CANADIAN
GRAIN
COMMISSION
1974**



**AGRICULTURE
CANADA**

Minister
Hon. Eugene Whelan

Deputy Minister
S. B. Williams

Information Canada
Ottawa 1975
Cat. No. A91-1/1974

CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba,
February 28, 1975.

The Honourable Eugene Whelan, M.P.,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

We are pleased to submit the 1974 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act.

The report contains a review of the Commission's principal activities during the year, together with information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1973-74 crop year, and a review of the quality of 1974 grain crops.

Respectfully submitted,

H. D. Pound,
Chief Commissioner.

C. L. Shuttleworth,
Commissioner.

F. M. Hetland,
Commissioner.

R. S. Allen,
Corresponding Secretary.

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INTRODUCTION

The Canadian Grain Commission is responsible for administering the Canada Grain Act and has general supervision over grain handling in Canada. It has the power to make regulations and orders that are consistent with the Act.

The Executive Division deals with policy and general administrative matters, provides financial and office services to all divisions, and includes the offices of the Assistant Commissioners.

The Inspection Division provides official inspection and grading of grain at various points across Canada, particularly grain received at and shipped from terminal elevators, and grain loaded to vessels for export at transfer elevators.

The Weighing Division is responsible for official weighing of grain at terminal, transfer and process elevators, weigh-overs of grain stocks, and also inspection and certification of scales in terminal and transfer elevators.

The Economics and Statistics Division conducts economic research, publishes complete data on the storage and handling of grain within the licensed elevator system, provides regulatory services of licensing and bonding of elevators and grain dealers plus the registration of terminal and transfer elevator receipts, and provides documentation services to the industry for all grain unloads at licensed terminal elevators.

The Research Laboratory carries on a program of research related to the quality of cereal grains and oilseeds, conducts quality surveys of current crops and shipments, and tests new varieties in collaboration with plant breeders and the Commission's Inspection Division.

The Canadian Government Elevators system, which is managed, operated and maintained by the Commission, is comprised of five inland terminals and one seaboard terminal.

In addition, the Commission constitutes Grain Appeal Tribunals, and Western and Eastern Grain Standards Committees. It also has responsibility for setting maximum lake grain freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

SECTION 1—GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1973-74

The commercial handlings of Canadian grains and oilseeds in the 1973-74 crop year fell short of last year's record levels but nevertheless were among the largest ever witnessed in the history of the Canadian grain trade.

Total stocks of wheat, durum wheat, oats, barley, rye, flaxseed and rapeseed carried over into the 1973-74 crop year were estimated at 677 million bushels with about 40% in store on farms. The total 1973 production of these grains — 1,488 million bushels — included 604.7 millions of wheat (all varieties), 326.9 of oats, 469.6 of barley, 14.3 of rye, 19.4 of flaxseed and 53.2 millions of rapeseed. The combined carry-over and production provided an available supply of 2,172 million bushels to meet our export and domestic requirements. This was 221 millions (9.2%) less than in the previous crop year.

Producers' deliveries of the major grains and oilseeds to the licensed elevator system — 886 million bushels — represented the third largest figure ever recorded in one crop year. Only in the previous two crop years were receipts greater than this.

Bulk exports (not including processed products) totaled 578.9 million bushels — a decrease of 27.5% from last year's record (798.3 millions) with the decline in wheat clearances accounting for about two-thirds of the total reduction. Clearances of each grain were below the previous crop year. Oats exports (800,000 bushels) were the smallest since 1891-92.

The available supplies were reduced a further 863 million bushels by domestic use, that is to say, utilization for human food, animal feed, seed and industrial processing. Combined with the bulk exports and exports of processed products, the total disposition amounted to 1,470 million bushels. This left a carry-over on July 31, 1974 of 702 million bushels, only slightly higher than a year earlier. About 32% of these stocks were located on farms.

Quality of Grain Marketed in 1973-74

Red Spring Wheat. Over 481 million bushels (13.1 million metric tonnes) of red spring wheat were marketed in Canada during the 1973-74 crop year. Almost 59% of the carlot movement of red spring wheat qualified for the top grade, No. 1 Canada Western, 22% qualified for No. 2 Canada Western, while just 4% was graded No. 3 Canada Western. Over 14% of spring wheat carlot shipments from country elevators was graded tough and damp.

Carlots of red spring wheat entering terminal elevators for subsequent export shipment are segregated into subgrades on the basis of protein content so that Canada can guarantee to her foreign customers

certain minimum levels of protein content. During the 1973-74 crop year, carlots of both No. 1 and No. 2 Canada Western red spring wheat destined for export through Atlantic ports were segregated by protein levels whereas at Pacific Coast ports only carlots of No. 1 Canada Western were segregated by protein content. In general, the quality of the carlot movement of red spring wheat for the 1973-74 crop year was little different from that of the previous year: grade for grade at comparable protein levels, loaf volumes were about the same. Loaf appearance, crumb texture and crumb color were slightly improved.

The predominant grades of red spring wheat exported from Atlantic ports during the crop year were No. 1 and No. 2 Canada Western at protein levels of 13.5% and 12.5%; lesser quantities of these grades at protein levels of 14%, 13% and 11.5% protein were also shipped. The grade No. 1 Canada Western at these same protein levels predominated in Pacific exports; considerable quantities of No. 2 and No. 3 Canada Western wheat unsegregated by protein content were exported from the Pacific Coast. Test weight levels were down fractionally from those in the previous 1972-73 crop year; baking absorption values were very slightly lower also, but loaf volumes were essentially the same and consistent with the guaranteed protein levels. For those grades not segregated by protein content, protein levels were about the same as in the previous crop year's exports. Flour yield was lower for No. 3 Canada Western Pacific shipments, but loaf volumes for all unsegregated grades were unchanged.

Amber Durum Wheat. Amber durum wheat marketings during the 1973-74 crop year totaled nearly 48 million bushels (1.3 million metric tonnes), down significantly from the previous crop year's 68.9 million bushels. About 37.8% of the year's carlot movement of durum wheat entered the grades No. 1 and No. 2 Canada Western, 32.4% qualified for No. 3 C.W., while 16.5% graded Extra No. 4 C.W. The amount of high moisture grain in the durum movement was again very low; slightly over 2% of the carlots were graded tough. Test weight and 1000-kernel weight were slightly lower this year than last for all grades. Wheat pigment levels averaged slightly higher this year for the top three grades No. 1, No. 2 and No. 3, but lower for the remaining grades. This year for the first time, pasta color was measured on whole spaghetti rather than on ground macaroni; spaghetti color levels were satisfactory for all grades.

The bulk of export shipments of amber durum wheat in the crop year was from Atlantic ports. All grades of Atlantic shipments, except Extra No. 4 were higher in kernel weight this year than last. Pigment levels in the semolina for all grades of Atlantic shipments were higher this year. Color of the spaghetti was satisfactory. Pacific shipments during the year were a little lower than Atlantic exports in test weight and kernel weight. Semolina pigment and spaghetti pigment levels were generally lower also.

Barley. Farmers' marketings of barley in the 1973-74 crop year totaled 235.1 million bushels (5.1 million metric tonnes), slightly lower than the 237 million figures for the previous year. Of the carlots qualifying for the Canada Western or malting grades, 11.1% represented six-row barley, while 8.5% were two-row types. The predominant grade was No. 1 Feed, accounting for 57.5% of the year's movement. This crop year brought a change in malting barley grades for both six-row and two-row

varieties. The grade No. 3 C.W. was dropped; grain previously entering this grade is now identified as No. 2 C.W. Grain previously entering the grades No. 1 and No. 2 is now identified as No. 1 C.W.

Both two-row and six-row barley, entering the new grades No. 1 and No. 2 C.W. in the 1973-74 crop year, was a little lower in test weight and kernel weight, and nitrogen content was a little higher than the corresponding barley movement of the previous crop year. Demand for two-row barley remained strong during 1973-74. Exports of two-row barley amounted to 10 million bushels of the total exports of 17.7 million bushels of malting barley. Exports of feed grade barley totaled 118.6 million bushels.

Oats. The quality and quantity of carlot shipments were not as high as for the previous year. Of the 9,201 carlots, down 19.4% from the preceding year, only 18.7% graded No. 3 C.W. or higher, down 7.2% from the 25.9% reported last year for milling grades.

Rye. In rye, there was a marked increase in the number of carlots grading No. 2 C.W., 61.6%, with a further 31.8% grading No. 3 C.W., with ergot, as usual, being the prime grading factor. Movement to terminals showed a 40% reduction from the previous year with only 2,942 carlots having been inspected.

Flaxseed. Flaxseed marketed in the 1973-74 crop year totaled 15.4 million bushels (0.39 million metric tonnes), a decrease of about 22% from the previous crop year. The bulk of the flax marketed (95.8%) was, as usual, of top grade. Oil content for the grades No. 1 and No. 2 C.W. averaged 42.4% (dry basis), the same level as for the previous year. The protein content of the oil-free flaxseed meal for the predominant grade, No. 1 C.W., was one-half a percentage unit lower this year.

Rapeseed. The volume of the rapeseed movement in the 1973-74 crop year was 43.8 million bushels (0.99 million metric tonnes), down markedly from the record movement of 63.0 million bushels of the previous crop year; 95.7% of the 18,199 total carlot movement graded No. 1 Canada Rapeseed. Oil content of the crop year rapeseed movement averaged 39.9% (8.5% moisture basis), fractionally lower than for the previous crop year. Protein content of the oil-free rapeseed meal averaged 35.7%, also down slightly from the previous year's average. The erucic acid content of the oil of the 1973-74 rapeseed movement averaged 12.1%, due presumably to a higher proportion of lower erucic acid rapeseed varieties in the 1973-74 movement.

Domestic Mustard Seed. Carlot inspections increased from 654 last year to 903 this year. There was a slight reduction in the overall quality due to immaturity and frost and, as usual, inseparable weed seeds were a degrading factor. Very little of this mustard seed was used domestically.

Domestic Buckwheat. Production continued to decline. Carlot inspections were down 40.6% with most of it qualifying for No. 3 C.W. or higher, which is satisfactory for export contracts.

Canada Eastern Grains. A decrease in carlot inspections of 38.0% was recorded with 2,071 cars being inspected, compared with the 3,344 last year. Wheat inspections accounted for 38.5% of the total carlot inspections, with 80.7% of the 798 wheat inspections qualifying for No. 1 or No. 2 C.E. White Winter. Corn inspections totaled 678, down 29.0%

from the previous year, with 70.6% grading No. 1 or No. 2 C.E. Yellow. Soybean quality was generally quite good with 74.0% grading No. 1 or No. 2 Canada Yellow and 20.9% assigned to an off grade because of excessive moisture. Pea bean quality was good with 80.5% of the 36 carlots grading Extra No. 1 or No. 1 C.E.

Growing Conditions, Grades and Quality, 1974 Crop

Western Canada experienced an unusually severe winter. For seven consecutive months, commencing in November 1973, temperatures across the prairies were below normal and precipitation was generally well above normal. The early spring was cool and melting of the snow was late. This coupled with heavy spring rains in many areas resulted in large-scale flooding, and a delay of two weeks or more in seeding. Precipitation was light and temperatures were above normal for several weeks following completion of seeding. By mid-summer, many areas experienced drought or near-drought conditions. Widespread rains and cooler weather prevailed through much of August but came too late to benefit much of the crops. Some drought-damaged fields were ploughed under. Large areas of the prairies were hit by frost in August or September before the crops were fully matured; grades suffered quite markedly. Harvesting was frequently delayed by rain and sometimes by snow, resulting in weathering of the grain and causing some sprouting. Considerable quantities of grain were harvested with moisture content in the tough and damp range, necessitating farm drying.

Red Spring Wheat. The 1974 crop of Western Canadian red spring wheat was estimated by Statistics Canada to total 439.4 million bushels (12.0 million metric tonnes), substantially smaller than the 533.2 million bushel crop in 1973. The carry-over of spring wheat from previous crops at July 31 (the end of the 1973-74 crop year) was estimated to be about 320 million bushels (8.7 million metric tonnes), a slight increase in the amount of carry-over one year earlier. As a result of the poor harvest conditions, the amount of wheat entering the top grades was much reduced this year. The Canadian Grain Commission estimated that about 17% of the 1974 crop would qualify for No. 1 Canada Western Red Spring Wheat, about 25% for No. 2 Canada Western, 29% for No. 3 Canada Western, while a further 29% is expected to enter the "Canadian Utility" grades.

The protein content of the 1974 crop of Western Canadian red spring wheat averaged 13.5%, up 0.2 units from the level of the 1973 crop and just below the long-term average value of 13.6% for all spring wheat crops from 1964 to 1973. New crop wheat from Saskatchewan averaged 13.7%, Manitoba wheat, 13.5%, and Alberta wheat, 13.0%.

Samples of the 1974 red spring wheat crop of the grades No. 1 and No. 2 C.W. were segregated on the basis of protein content, to provide a series of subgrades with protein levels corresponding to those minimum guaranteed protein levels obtained as carlots of wheat are unloaded at terminal elevators, i.e., 14.5, 13.5, 12.5 and 11.5%. The new-crop samples were further divided into two groups, depending on whether the samples were grown in the Eastern or Western prairie por-

tion of the growing area (and correspondingly would be exported through either Atlantic or through Pacific seaport terminals).

Samples of new-crop No. 3 Canada Western Red Spring Wheat were not segregated by protein content, but were simply separated into an Eastern and a Western prairie composite.

Because of the poor growing and harvest conditions, the amount of No. 1 and No. 2 Canada Western Red Spring Wheat will be limited throughout the remainder of the current crop year. Furthermore, in view of the average protein level of 13.5% for the 1974 crop and the slightly lower 13.3% average level of the 1973 crop, the available amounts of the higher protein segregates will be quite limited. Nevertheless, for the new-crop grades No. 1 and No. 2 C.W., an increase in protein content is accompanied by a corresponding increase in loaf volume coupled with better loaf appearance. Physical dough properties, as reflected in farinograph, extensigraph and amylograph characteristics also show increasing strength. Test weight, kernel weight, flour, ash and starch damage all decrease with increasing protein. Differences between No. 1 C.W. and No. 2 C.W. red spring wheat at comparable protein levels are generally small.

No. 3 Canada Western, Eastern prairie, red spring wheat is significantly higher in protein content than that from the Western regions and this is reflected in higher loaf volumes. The protein content of No. 3 C.W. Eastern prairie red spring wheat is comparable to that of No. 2 C.W. wheat at the 13.5% protein level. However, by comparison with No. 2 C.W. 13.5, the No. 3 C.W. is lower in test weight, flour yield, baking absorption and baking performance.

The protein level of No. 3 C.W. Western prairie red spring wheat approximates that of No. 2 C.W. Western prairie wheat at the 12.5% protein level. However, the No. 3 C.W. grade is lower in test weight and flour yield; it is poorer in flour ash content, flour color, loaf volume and bread crumb color.

Eastern prairie new-crop wheat grading No. 1 and No. 2 Canada Western is slightly higher in kernel weight and for the most part in flour yield, and significantly higher in baking absorption than 1973-74 fourth quarter cargo export shipments. The level of alpha-amylase activity is about the same for No. 1 C.W. wheats but is significantly lower (better) for No. 2 C.W. wheats. Flour ash content and flour color are higher (poorer) and this is reflected in a slightly poorer crumb color in the bread. Eastern prairie new-crop wheat of the grade No. 3 Canada Western is significantly higher in wheat and flour protein content than fourth quarter cargo exports. The new-crop wheat gives significantly higher flour yield and although this is accompanied by poorer flour color, the color of the bread crumb is not lower this year.

Western prairie new-crop wheat grading No. 1 and No. 2 Canada Western is slightly higher in test weight, flour yield, and baking absorption than Pacific seaport cargoes exported during the fourth quarter of the 1973-74 crop year. The level of alpha-amylase activity in the No. 2 C.W. new-crop wheat represents an improvement over recent cargo shipments. Western prairie new-crop wheat of the grade No. 3 Canada Western is about equal to recent exports in protein content. Baking absorption is a little higher but loaf volume and bread characteristics are a

shade lower this year. The level of alpha-amylase activity for the new-crop wheat is significantly lower (better) this year.

This year, because of the significant quantities of wheat entering the "Canada Utility" grades, the milling and baking characteristics of type samples of the No. 3 Canada Utility grade were examined. This grade is made up of wheat of any variety which had been so severely affected, in terms of visual appearance, by adverse growing and harvest conditions, that they failed to qualify for the Canada Western grades.

The No. 3 Canada Utility grade contained large amounts of frosted wheat and was much more difficult to mill than the Canada Western grades of red spring wheat: much of the flour was produced at the tail end of the mill. The No. 3 C.U. grade was markedly lower than the No. 3 C.W. grade in flour extraction and the flour was much darker in color. The breadmaking performance was much poorer than that of the No. 3 C.W. red spring wheat, but nevertheless, a fair loaf of bread can be produced, particularly in the short Chorleywood process in a 50-50 blend with soft white winter wheat flour.

Amber Durum Wheat. The 1974 crop of Western Canadian amber durum wheat is estimated to be 61.5 million bushels (1.7 million metric tonnes). Lower grades predominate in the 1974 amber durum wheat because of adverse growing conditions and frost damage. It is expected that about 35% of the crop will grade No. 4 Canada Western, about 20% will enter each of the grades No. 3 and No. 5 C.W., only 18% will qualify for the top two grades No. 1 and No. 2 C.W., while 2% will grade Extra No. 4 C.W. and the remaining 5% will be No. 3 Canada Utility.

The protein content of the 1974 amber durum wheat crop averages 13.5%, compared with 13.4% for the 1973 crop. For the predominant grades No. 3, No. 4 and No. 5 Canada Western, test weights are not appreciably different this year from last. Pigment content of the semolina and the spaghetti for grades No. 4 and No. 5 C.W. are lower this year and spaghetti color is poorer. Gluten strength is good for all grades.

Barley. The 1974 crop of Western Canadian barley is estimated to be 375.4 million bushels (8.2 million metric tonnes), about 17% smaller than the 444 million bushel crop in 1973. The adverse growing and harvesting conditions were also damaging to the barley crop; only about 19% of the six-row and two-row new-crop barley is expected to qualify for the malting grades, with the No. 1 Feed grade predominating, and accounting for 56% of the crop. For the third year in succession, only the early ripened grain was harvested under good conditions; early harvested samples were plump and had high bushel weight. The wet weather which prevailed for most of the harvest season produced severe weather-staining. Severe frost damage is also evident in much of the crop. Problems of dormancy and water-sensitivity are widespread. The 1974 barley crop was the poorest for many years and very careful selection will be required to locate barley suitable for the requirements of the malting industry.

Flaxseed. The 1974 crop of Western Canadian flaxseed is estimated to be 14.3 million bushels (363 thousand metric tonnes), about 25% smaller than the 1973 crop. Flax was particularly affected by poor growing and weather conditions during harvest periods. An unusually low proportion, 35%, is expected to qualify for the top grade, No. 1 C.W. The oil content of the new-crop flaxseed averages 43.5%, up significantly from

the 41.9% level in the previous crop. The protein content of the residual oil-free flaxseed meal is two units lower this year at 39.8%. The iodine value determined on the oil is 9 units higher this year, averaging 196 units.

Rapeseed. Production of rapeseed in Western Canada in 1974 is estimated to be 52.9 million bushels (1.2 million metric tonnes), a very slight decrease from the 53.2 million bushel crop in 1973. Low erucic acid content varieties of rapeseed accounted for nearly 94% of 1974 acreage. The oil content of the new-crop rapeseed averages 40.8% (8.5% moisture basis) compared with a 39.0% average in 1973. The protein content of the oil-free rapeseed meal averages 35.6%, essentially the same as for the 1973 crop. The erucic acid content of the rapeseed oil for the 1974 crop averages 4.3%, with the range going from 0.0 to 38.1. Just over 81% of the harvest survey samples had an erucic acid content below 5%.

Eastern White Winter Wheat. White winter wheat production in southwestern Ontario in 1974 is estimated to be 19.1 million bushels (519 thousand metric tonnes), compared with the 14.8 million bushel production in 1973. The protein content of the 1974 crop averages 9.0%, the lowest level in the 11 years since the commencement of the survey of eastern white winter wheat.

Eastern Canadian Soybeans. The 1974 crop of soybeans grown in Eastern Canada is estimated to be 11 million bushels (300 thousand metric tonnes), a marked drop from the record production of 14.6 million bushels in 1973. The oil content of the 1974 soybean crop averages 21.2% (moisture-free basis) with the values ranging from 18.7 to 25.5%. The oil-free soybean meal averages 51.7% for protein content, with the range from 48.3 to 55.8%.

Canada Eastern Corn. Conditions throughout the season were generally unfavourable with late seeding and poor growing weather, and an early frost. Yield projections were estimated at 78 bushels per acre for both provinces, an increase of 5 bushels for Quebec and a decrease of 3 bushels for Ontario, from the previous year's yield. Seeded acreages increased in both provinces, up 75,000 acres in Ontario and 40,000 acres in Quebec.

Meetings of Grain Standards Committees

The Western Grain Standards Committee met in Winnipeg on November 5, 1974. The main topic of discussion was the poor quality of the crop, due to late seeding and inclement weather at harvest time. The Directors of the Grain Research Laboratory and the Grain Inspection Division both dwelt on the cause and effect of the abnormally poor harvest. The Committee appointed in 1973 to study the grading tolerances for export grain presented their recommendations to the Commission for its consideration on June 25, 1974. The recommendations were voted on by the Committee and tabled. Reports from the Commission's entomologist and the person responsible for the Glenlea program were read. The Committee recommended the establishment of 38 samples as primary standards and 11 samples as export standards for the 1974-75 crop

year. Included in the 11 samples as export standards was No. 3 Canada Utility wheat. Because of the world food situation, it was expected that large quantities of No. 3 Canada Utility wheat would be exported.

A special meeting of the Western Grain Standards Committee was convened on November 28, 1974, to make recommendations to the Commission on a proposed amendment to the specifications of the export standards for No. 3 Canada Utility wheat. After some discussion and presentation of milling and baking data, the proposed amendment was adopted, to reduce the maximum content of foreign material from 15.0% to 5.0%, reduce the maximum of heat damaged grains from 15.0% to 10.0%, and establish a maximum of 10.0% for Amber Durum content.

Two meetings of the Eastern Grain Standards Committee were held. On August 28, 1974, it met at London, Ontario, and selected and recommended 14 samples as standard samples for winter wheat, barley, rye and oats. The second meeting was held at Montreal, on November 8, 1974, and received reports on growing and harvesting conditions, as well as grade quality of fall crops in Ontario and Quebec. The Committee selected and recommended 13 samples as standard samples of corn, soybeans and pea beans. At both meetings, reports from the Grain Research Laboratory, Grain Inspection Division, as well as the first report of the Commission's Grain Sanitation Officer, Entomology Section, were read. The Committee was advised that the new Eastern Corn Chart No. 3 had been distributed for use in the testing of high-moisture corn, and that the investigation of the problem would be continued in 1975.

Dr. J. W. Morrison, CDA Research Branch, Ottawa, a member of both Eastern and Western Committees, reported to both the Committees on objectives and progress in research on cereal and other grains. He also informed the Committees that CDA scientists had again visited the People's Republic of China in 1974.

Committee memberships as constituted under Section 17 of the Canada Grain Act are listed in Appendix B of this report.

Variety Testing

The Inspection Division received about 2,800 samples of wheat and barley varieties from Canadian plant breeders for examination and report on visual kernel characteristics. Included were 55 varieties of wheat and 68 varieties of spring and winter barley grown in 1974 Eastern and Western co-operative variety tests, which were reported to the Canada Committees on Grain Quality and Plant Breeding.

Each year, the Grain Research Laboratory carries out a detailed examination of the quality of plant breeders' cultivars of red spring and amber durum wheats and malting barley. New cultivars which have shown promise in terms of agronomic performance and disease resistance are assessed for end-use quality characteristics, e.g., milling and baking, milling and pasta-making, malting and brewing. Varieties which meet the overall quality level of those varieties named in the Canada Grain Act as statutory standards of quality ultimately may be licensed as grains of commerce for Western Canada. This work, which is co-ordin-

ated by the Canada Committee on Grain Quality involved tests on 25 cultivars of red spring wheat and 32 cultivars of amber durum wheat grown in the 1973 co-operative test and evaluated for quality in early 1974. The Laboratory's normal evaluation of barley cultivars was suspended this year pending completion of construction of a redesigned malting facility.

The Research Laboratory participated again this year in the annual wheat quality evaluation program organized by the Crop Quality Council of the United States. The Laboratory was one of 21 collaborators testing 36 flour samples from wheats developed for the American upper mid-west area.

SECTION 2—DOCUMENTATION AND ELEVATOR OPERATIONS

Grain Documentation

Documentation Services. The Economics and Statistics Division provides a documentation and reporting service for inward and outward grain movement at licensed terminal elevators in the Western Division. The basic information is extracted from reports of the Inspection and Weighing Divisions to provide the input to the Division's data processing facilities for production of documents such as Certificates for Canadian Grain, Terminal Elevator Receipts and Terminal Elevator Outturns. These documents are produced in Winnipeg or Vancouver for distribution within the grain industry. A telecommunications network, involving direct computer to computer communication in some instances, enables the information to be distributed to the grain handling companies, the railways and the Canadian Wheat Board. This information becomes direct input to the internal accounting systems of these organizations as well as providing the basis for calculating payments for grain, storage and freight. It is also the source of much of the statistical information which the Division publishes.

Statistics. Licensees are required to submit prescribed records and periodic reports of stocks and handlings of grain as a basis for the Commission's control and supervision of the elevator system. The Economics and Statistics Division also receives corresponding data from other divisions of the Commission, from the Canadian Wheat Board and from other organizations and associations within the grain trade. From this information the Division compiles and publishes comprehensive bulletins relating to the storage and movement of Canadian grain within the Canadian elevator system and to domestic and export markets. Throughout the year these reports were distributed to Canadian and overseas correspondents and also served as a basis for supervisory and regulatory assessments within the Commission, the Canadian Wheat Board and related agencies.

As the principal source of Canadian grain storage and handling statistics, the Division worked closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, and other federal and provincial government offices. On a correspondent basis, it exchanged data and provided statistical assistance internationally with the Commonwealth Economic Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the United States Department of Agriculture.

Summary statistics pertaining to the 1973-74 crop year appear in the tables forming part of Appendix A and a list of the principal statistical releases is included in Appendix C.

Licensing and Bonding. As at August 1, 1974, the Commission issued a total of 4,379 licences for all elevator categories compared with 4,468 a year earlier, plus 27 grain dealer licences compared to 17 the year previous. Total licensed storage capacity decreased to 647,652,710 bushels from 660,876,410 bushels. A reduction of 5.7 millions occurred

in the primary elevator system, while terminal elevator capacity dropped 8.7 millions. The process elevator capacity reflected an increase of 1.2 millions while transfer storage was unchanged from a year ago.

Guarantee bonds in the amount of \$53,999,135 executed by 17 surety companies were deposited with the Commission as security by the licensees during the crop year 1973-74.

Terminal, transfer and primary elevator licensees were required to maintain adequate insurance on grain stocks in their licensed premises. The insurance policies supporting this coverage were filed with the Economics and Statistics Division, which in turn verified the adequacy of this coverage by comparison with regular stock reports submitted by licensees.

Registration. Operators of terminal and transfer elevators are required to issue terminal or transfer elevator receipts for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration become negotiable documents to be used as collateral by the grain companies in financing the movement of the grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver and Montreal, the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipment.

Primary Elevators

Inspection of Elevators. The Commission has Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Calgary, to keep the Commission in close touch with the operations of licensed primary elevators in the Prairie Provinces.

During 1974, the Assistant Commissioners inspected 523 elevators in Manitoba, 1,221 in Saskatchewan and 279 in Alberta, a total of 2,023. This inspection included checks on scales, sieves, moisture meters and certain other equipment; deductions for shrinkage, and posting of current Commission regulations applying to primary elevators.

In the Eastern Division, the Assistant Commissioner is located at Harrow, Ontario. During the year he visited over 200 country elevators in that province.

In addition to their regular program of inspections, the Assistant Commissioners assisted in the investigation of producers' complaints and of reported infractions of the Commission's regulations and orders. They also received and handled numerous inquiries from producers and elevator operators on various matters such as grain grading and movement; participated in special investigations, surveys and projects; and publicized the work of the Commission through contact with both the farm and the business community.

Weigh-overs. The results of the 1973-74 primary elevator weigh-over program conducted by licensed grain companies are summarized in the following table.

The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners are given authority to deal directly with elevator managers and superintendents where excessive overages or shortages have been reported.

Elevators reporting	1973-74	1972-73
Shortages.	288	414
Neither overages nor shortages .	27	27
Overages of less than .25%	267	310
Overages of .25% to .50%	360	383
Overages over .50%	485	526
Total number of elevators weighed over	1,427	1,660

Tariff of Charges. A revised maximum tariff for primary elevators went into effect on August 1, 1974. This included a maximum rate for elevation of 10½ cents per bushel for all kinds of grain and was designed to allow a greater degree of flexibility in the actual tariffs filed by licensed elevator operators.

Terminal, Process and Transfer Elevators

Services. All grain received at and shipped from licensed terminal elevators in the Western Division was sampled and graded by staff of the Inspection Division, and weighed under supervision of the Commission's weighing staff. Inspection and weighing services were also provided at licensed process elevators in the Western Division.

At licensed transfer elevators located at St. Lawrence River and Maritime ports, grain loaded into vessels for export was sampled, inspected and certified. Other sampling, inspection and weighing services in the Eastern Division were provided only on request. The inspection unit at Chatham, Ontario, sampled and graded a considerable volume of eastern-grown grain for the grain trade in that area.

Information on the quantity of grain inspected and weighed during the 1973-74 crop year is given in Appendix A.

Terminal Elevator Grain Drying. During the 1973-74 crop year, about 63 million bushels of high-moisture grain were artificially dried at terminal elevators under supervision of the Commission's Inspection Division. This was a considerable increase over the 24 million bushel quantity processed during the previous year, and indicated a greater proportion of high-moisture grain in carlots shipped to terminal elevators than from crops harvested in 1973.

Weigh-overs. When possible, official weigh-overs are conducted annually at licensed terminal and transfer elevators by groups of em-

ployees of the Weighing and Inspection Divisions. While a weigh-over is in progress, all normal elevator operations cease, and the grain handling equipment and stocks of grain remain under the full control of the weigh-over crew. The contents of every storage bin are weighed, sampled for verification of grade and recorded. This work may take from a few days to several weeks, depending on the size of the elevator and the quantity and type of grain in store. The Economics and Statistics Division compiles totals of outstanding elevator receipts and handlings by grain and grade, obtains statements of stocks on hand from the Weighing Division and summarizes the results of each weigh-over for review by the Commission. The purpose of these audits is to enable the Commission to determine whether the grain handling operations at elevators have resulted in any excessive overages or shortages in the various kinds and grades of grain, and to establish the validity of commercial documents covering stored grain.

During the 1973-74 crop year, 24 terminal and 11 transfer elevators were weighed over.

Inspection of Equipment. Three hundred and seventy-two scales in licensed terminal and transfer elevators were inspected, verified and certified by scale inspectors on the staff of the Commission's Weighing Division. These inspectors act as inspectors under the Weights and Measures Act by special arrangement with the Department of Consumer and Corporate Affairs. In addition, special inspections were made by Weighing Division scale inspectors whenever any doubt arose as to the continued accuracy of a scale in a terminal or transfer elevator.

Plans and specifications for new elevator facilities and alterations to elevators and grain handling equipment were examined before permission was given for commencement of work by elevator managers. A total of 21 such projects were reviewed, including installations of dust control systems, automatic scales and vessel loading facilities. When completed, new facilities and installations were inspected by officials of the Weighing Division to ensure the absence of conditions which might affect the accuracy in weights of grain being received and shipped.

New Equipment. In 1974, as part of the Commission's program for the development of a rapid test method for protein segregation, an automated digital analyzer was purchased. This machine, if effective, will have the capability of determining the protein content of some 4,000 samples per day (7½ hrs.) and will replace the work being done by the present Kjeldahl method at Calgary, and a large part of the work of the Kjeldahl laboratories at Thunder Bay and Winnipeg.

Feasibility tests are currently being conducted and will be continued in 1975, on the use of grain quality analyzers in terminal elevators. The testing of three makes of grain quality analyzers is being carried out, as well as the on-site operational evaluation of the grain quality analyzers in terminal elevators. If feasible, this machine would enable the Commission staff to determine the protein content of red spring wheat on receipt at terminals. Since the rapid transportation of samples to the inspection offices is essential to the analyzer application, the Inspection Division is ensuring, with the co-operation of terminal management, that pneumatic sample transport systems are installed where they are required.

Thirty-eight manually operated mechanical scales in terminal and transfer elevators were replaced by automated electronic scales and control systems. This new scale equipment and that installed in preceding years received thorough testing by scale technicians on the staff of the Commission's Weighing Division.

Tariff of Charges. The maximum tariff for licensed terminal elevators was amended, effective April 15, 1974, to permit increased charges for drying wheat and some other kinds of grain. Effective August 1, 1974 this tariff was revoked and replaced by a revised tariff which included all amendments to that date and also increased maximum elevation charges. The revised elevation rates are 4½ cents per bushel for wheat, oats and barley; 5½ cents for rye; 6½ cents for flaxseed; 7½ cents for rapeseed and mustard seed.

The maximum tariff for licensed transfer elevators in the Eastern Division was amended effective June 1, 1974 by increasing the rate for basic elevation and by increasing the rate for storage from 1/25 cent to 1/20 cent per bushel per day.

Canadian Government Elevators

The Canadian Grain Commission manages and operates five inland terminals and one seaboard terminal.

Handlings. Total receipts of grain during the 1973-74 crop year were 49.8 million bushels. This was an increase of 4 million bushels over the previous all-time record of 45.8 million bushels which was attained during the 1972-73 crop year and a substantial increase over the historical average of approximately 20 million bushels. Total shipments of grain were 44.6 million bushels. Approximately two-thirds of the grain received was wheat, with the balance consisting of oats, barley, rapeseed, flaxseed, mustard seed, corn and canary seed. Receipts and shipments at elevators were as follows:

Elevator	Capacity	Stocks August 1, 1973	Receipts	Ship- ments	Stocks July 31, 1974
— thousands of bushels —					
Moose Jaw	5,500	719	3,625	2,326	2,018
Saskatoon	5,500	2,953	10,427	9,248	4,132
Calgary	2,500	1,133	4,434	3,617	1,950
Edmonton	2,350	522	5,588	4,451	1,659
Lethbridge	1,250	43	7,396	6,685	754
Prince Rupert	2,250	764	18,377	18,317	824
Totals	19,350	6,134	49,847	44,644	11,337

Charges. A revision of all elevation charges was authorized effective August 1, 1974, and maximum permissible charges are in effect for all grains as specified in schedule C of the Canada Grain Regulations.

Commercial Trucking. All interior terminals with the exception of Calgary were heavily engaged in a commercial trucking movement where wheat and barley were received. The grain was subsequently shipped to Vancouver, Prince Rupert, Thunder Bay and Churchill as required by the Canadian Wheat Board to meet their export shipping commitments.

Unit Train. Red Spring and Alberta Winter Wheat received into Lethbridge by commercial truck was subsequently shipped to Vancouver via unit train composed of 82 hopper cars. Shipments were made to Vancouver from March to July using the same cars, which had a turn-around time of seven days. The unit train concept proved to be a very efficient vehicle for rapid transportation of specialized grades of grain and better utilization of railroad equipment. It resulted in a large volume of handling during the short period it was in effect.

Equipment. The electrical and mechanical rehabilitation program at the Edmonton elevator was almost completed and a similar project was commenced at the Calgary elevator. Several major equipment projects were initiated at Prince Rupert, including a boxcar dumper, a grain dryer with a capacity of 2,000 bushels per hour, and apparatus for controlling air pollution by grain dust. At Saskatoon, a special cleaning system for oilseeds was installed, and mechanical grain sampling equipment was ordered for installation at both the Saskatoon and the Moose Jaw elevators.

These projects have been undertaken to improve operating efficiency, and in some cases, to ensure compliance with safety and anti-pollution requirements.

Complaints and Inquiries

Producers' Complaints. During 1974, the Commission and the Assistant Commissioners investigated 12 written complaints about producer transactions with operators of licensed primary elevators. In all of the disputes it was possible to arrange satisfactory settlements between the parties concerned.

In addition, the Assistant Commissioners dealt with a variety of informal complaints and, when necessary, advised elevator managers and local superintendents on correct procedures.

Cargo Shortage Complaints. No formal complaints were received about the weights of vessel shipments unloaded at Eastern Canadian ports. However, inquiries were received about 11 shipments where excessive shortages had been indicated. Officials of the Weighing Division investigated both the loading and the unloading of the cargoes whenever possible and provided reports to the parties concerned. There was no evidence that the reported shortages resulted from defective elevator scales or faulty weighing practices.

A total of three complaints were received about outturn weights reported from overseas destinations. Investigations were conducted into the weighing of the shipments at the loading elevators in Canada and reports were forwarded to the complainants; no evidence was found to

account for the reported shortages in weight. The Commission also reviewed information supplied by the complainants on unload procedures and equipment at the overseas ports.

Overseas Quality Complaints. A total of three complaints were received about aspects of the quality of grain shipped to overseas destinations. Thorough investigations were carried out by the Inspection Division; official samples taken from the shipments at the time of loading were studied and subjected to special tests. Detailed reports of the Commission's investigations were sent to complainants for their information. On the basis of the tests on the loading samples, no justification was found for the complaints.

SECTION 3—RESEARCH, INFORMATION AND OTHER SERVICES

Research

Laboratory Research. Basic and applied research investigations on the composition and properties of components of red spring wheat, amber durum wheat, barley, and oilseeds, particularly in relation to their end-use potential, represent an important phase of the annual program of the Grain Research Laboratory. A brief summary of Laboratory research projects in progress or completed during 1974 is given in the following few paragraphs.

Studies of enzyme systems in cereal grains continue to represent a major area of Laboratory research. A fluorometric assay for determining proteolytic activity in cereals and flours has been developed. A colorimetric method for determining alpha-amylase activity in wheat and other cereals has also been developed. The isolation of a heat-stable peroxidase from wheat flour has been achieved in another study; the effects of this purified enzyme on rheological and breadmaking properties of dough is currently being studied.

Studies of the effects of gliadin fractions separated by gel filtration, on the mixing properties of a synthetic dough system suggest that the molecular weight distribution of such components may be important in determining overall flour quality.

Several investigations, using infra-red reflectance spectroscopy, have been carried out. The major project is an assessment of this technique for the determination of protein and moisture content for the purpose of segregation by protein content of carlots of red spring wheat, as they are unloaded at terminal elevators. Studies are presently underway to assess the feasibility of converting to the infra-red reflectance system of protein content determination for the spring wheat movement into terminal elevators during 1975.

A phenomenon termed "un-mixing" has been observed in studies of the mechanical development of dough using combinations of normal (high) and slow-speed mixing. (Mixing of dough above a certain critical mixer speed is necessary to produce optimum bread. Slow speed mixing even for prolonged periods does not produce optimum dough development and optimum bread). If, following optimum dough mixing at normal speeds, mixing is continued, but at slow speed, dough and bread properties are similar to those for doughs mixed only at slow speed. Further mixing at normal speed will re-develop the dough and produce bread comparable to that from a single high speed mix. Several cycles of mixing, "un-mixing" and remixing were possible without marked deterioration in the bread when strong flours were used.

To permit more detailed fundamental studies of milling and what constitutes quality in wheat in relation to milling, a test pilot-scale mill that relates to both laboratory and commercial milling has been designed. The mill is compact and versatile, and will have a maximum capacity of 500 pounds per hour, but will be suitable for milling 60 to 100 pound

samples. It is hoped that construction and installation will be completed before the end of 1975.

Research in the area of durum wheat has included a continuation of the study of polyphenol oxidase activity. Current results show that polyphenol oxidase activity in the wheat is directly related to the undesirable brownish color in the spaghetti of certain durum cultivars. In another study, a search is underway for a small-scale rapid quality prediction test for the screening of early generation materials in plant breeders' programs. Measurement of the viscosity of a dilute acetic acid extract of semolina offers promise as an indicator of spaghetti cooking quality. In still other work, modifications have been made to the mixing bowl of the farinograph mixer to permit dough mixing in a confined space to simulate mixing in a continuous extrusion press. Under these simulated commercial mixing conditions, maximum dough consistency is reached almost immediately and drops very quickly for all varieties. The characteristic gluten strength of individual varieties shows up in differences in the width of the mixing curve and in the rate of decrease of dough consistency. Finally, because of the significant amount of wheat consumption in the form of noodles, a project has been initiated to characterize wheats, especially the high-yielding non-bread wheats, in terms of quality for noodle production.

Certain research investigations on malting barley have led to development of new analytical methods. These include: the development of an automated colorimetric procedure for determining diastatic activity of barley and malt by means of which 25 to 40 samples can be assayed each day, the development of a method of determining the starch content of barley samples, involving quantitative enzymatic conversion of starch to glucose and the use of an automated glucose oxidase assay to determine glucose.

Changes in barley constituents during germination and malting are being followed. The alpha-amylase isoenzyme patterns of several varieties of germinated barley were compared, using isoelectric focusing techniques. Differences were detected between some varieties, and the study is continuing in order to separate, purify and characterize these isoenzymes. In another study, changes in free sugar content of Centennial barley during malting were determined. Sucrose, the major free sugar in barley and malt, decreases during initial stages of germination, then increases markedly up to six days of germination. Lysine, an essential amino acid in human nutrition, was the subject of two studies. In the first, the Beckman amino acid analyzer was used to determine lysine content of 223 barley samples from a plant breeding program attempting to produce new cultivars high in lysine content. The second was a comparative study of five methods in a search for a rapid-screening test for lysine. The Udy dye-binding method and a ninhydrin method appeared the most promising.

Studies related to the amylose content of barley have continued. The amperimetric titration method was applied, not to a prime starch from barley, but to finely ground pearled barley in a study to identify high amylose progeny of crosses between the high amylose mutant of Glacier barley and two normal amylose barley cultivars. The new method is much faster and readily distinguishes between high amylose and normal level amylose barleys.

Investigations in the pesticide residue section have focussed recently on fumigant residues. Techniques for the extraction of fumigants from grain, the separation, identification and confirmation of individual fumigants by gas-liquid chromatography are progressing favourably.

Literature reviews on Animal Feed, Barley for Feed, and Oats for Feed were compiled. A survey of wild oat content in feed barley was completed. Also, a study of the nutritive composition of dockage in Canadian cereals and oilseeds was carried out. Examination of the amino acid composition of common weeds that constitute dockage showed that many, in addition to having an excellent amino acid balance, are higher in their content of essential amino acids than the cereals commonly used for feed purposes.

Statistical and Economic Studies. The Economics and Statistics Division continued with studies of the structure and level of maximum grain handling tariffs for services rendered by licensees. A tariff review committee issued a report in March, 1974 with recommendations of tariff policy applicable to licensed primary and terminal elevators. The Division participated in the Commission's consideration of recommendations contained in the report and assisted in implementing certain policy recommendations adopted by the Commission for the 1974-75 crop year. The Division took part in the implementation of the domestic feed grain policy which came into effect in the 1974-75 crop year. Internal studies conducted by the Division included a review of the structure and level of fees charged to the industry for services provided by the Canadian Grain Commission.

The Economics and Statistics Division again participated in the design, implementation and analysis of the second year of an experimental harvest survey of spring wheat. The object was to study methods to improve the timeliness and accuracy of estimation of the protein content and other quality factors of the new crop and incorporate these findings in a routine, annual harvest survey.

Statistical research projects were conducted to refine procedures for operating and monitoring the segregation of wheat by protein content at terminal elevators. In co-operation with other divisions, studies on the introduction of new protein segregation methods have been carried out.

Information Program

Publications. The Commission issued and distributed a booklet to provide elevator managers, processors, exporters and overseas buyers and other interested parties with information on the organization and functions of the Canadian Grain Commission, on the grades of Canadian grain, and on the importance of quality control of grains and oilseeds within Canada's bulk handling system.

Statistics on the movement and storage of grain within the licensed elevator system were published and distributed regularly through a series of bulletins issued by the Economics and Statistics Division.

The Commission published and distributed the 1974 red spring wheat protein map, and separate crop bulletins detailing the quality of

the 1974 crops of Western Canadian red spring wheat, amber durum wheat, barley, and flaxseed and rapeseed. Information on the 1974 crops of Eastern white winter wheat and Eastern soybeans was distributed to the appropriate segments of the grain trade. The Research Laboratory continued the publication of its regular quarterly cargo bulletins summarizing the milling and baking and the milling and spaghetti-making quality of Canada's export shipments of red spring and amber durum wheat.

The Commission's Research Laboratory publishes a separate report, giving a comprehensive review of its activities for the calendar year. In addition, members of the staff of the Research Laboratory published a total of fifteen scientific and technical papers detailing results of basic and applied research projects. These articles appeared in eight different scientific journals.

The Commission's publications are listed in Appendix C.

Meetings. Members of the Commission and senior officials accepted a number of invitations to address annual meetings of producer organizations and to discuss topics of current interest relating to the Commission's work. In addition, they attended meetings held by other organizations and university faculties which are concerned with grain marketing, warehousing and transportation.

Members of the professional and senior technical staff of the Research Laboratory represented the Commission at a total of fifteen scientific and technical conferences during the year. Three of these were conferences held overseas.

The Commission convened regular annual meetings of the Western and Eastern Grain Standards Committees and one special meeting of the Western Committee.

Overseas Visits. Senior officials and technical experts of the Commission visited Europe, Great Britain, Japan, Hong Kong, Southeast Asia and Australia. The purpose of these visits was to meet with importers, millers, cereal research and government personnel to provide them with detailed information about the various grades of Canadian milling quality wheat, oilseeds and feed grains, particularly the 1974 crops of these commodities. Discussions also dealt with grain inspection and certification systems, and facilities for research, marketing, storage and transportation.

Tours of Commission Facilities. Many visitors and missions from foreign countries toured the inspection and laboratory facilities of the Commission during the year. These included missions from Brazil, Japan and Mexico; also government officials from Bangladesh, India, Portugal, United States of America and several other countries.

Special tours and lecture sessions were arranged for participants in the courses sponsored by the Canadian International Grains Institute, groups of country elevator managers, university students in agriculture, and assistant trade commissioners-in-training from the Department of Industry, Trade and Commerce.

Films. The Commission's films, *Canadian Wheat* and *Grain Handling in Canada*, were shown to many interested individuals and groups. Preliminary arrangements were made by the Commission and the Produc-

tion and Marketing Branch of Agriculture Canada for joint production of a film dealing with sanitation and insect control in grain storage facilities.

Other Services

Pesticide Residue Monitoring. The Research Laboratory has, for several years, maintained a program of monitoring Canada's cargo exports for residues of pesticide treatment chemicals. During 1974, 1,325 cargoes of red spring wheat, 331 cargoes of amber durum wheat and 243 cargoes of barley were checked for organochlorine and organophosphate residues to ensure conformance with the tolerances applying in various market areas of the world. Another aspect of the quality control of Canadian grains is the monitoring for the presence of mercury-containing seed-treatment chemicals in grains moving forward to market positions.

Erucic Acid Monitoring of Rapeseed. The program of monitoring the carlot movement within Canada for the erucic acid content of rapeseed continued during 1974. During the year, the Research Laboratory checked the erucic acid content of 2,879 carlots of rapeseed. In the same program, all 142 cargoes of rapeseed exported from Canada during 1974 were analyzed for erucic acid content. Cargo samples were also checked for oil content and protein content of the oil-free rapeseed meal. To aid in the marketing of rapeseed, the oil content of rapeseed cargoes was provided to the rapeseed industry on a monthly basis.

Protein Segregation of Wheat. The segregation at terminal elevators of red spring wheat by protein content continued to function effectively. During the year, because of low volume and limited demand, the segregation at the 11.5% protein level was discontinued on the grades of No. 1 and No. 2 Canada Western Red Spring Wheat at Thunder Bay.

The procedures for the segregation of wheat by protein content, including both the management and monitoring of the system, have remained essentially the same as those developed during the 1971-72 crop year. The segregation system continues to rely upon the co-ordinated efforts of several sections of the Canadian Grain Commission and the Canadian Wheat Board.

The general standard of deviation of the average protein content of cargoes about the overall average for the highest volume guaranteed level, was reduced to 0.12% from the previous 0.14%. This indicated less variability existing within protein levels and a greater uniformity between cargoes. This is borne out by the absence of any formal complaints over guaranteed protein levels from Canada's customers.

An experimental red spring wheat harvest survey was again conducted in 1974, with only minor modifications to the 1973 elevator manager survey. The experience gained from these two experimental surveys has resulted in planned revisions to the sample collection procedures to be used in the 1975 harvest surveys conducted by the Commission's Grain Research Laboratory.

The Commission continued its expanded research and testing program for the development of further equipment capable of establishing

levels of protein in wheat under the operating conditions prevailing in a grain elevator. Protein testing devices utilizing the principle of infra-red spectroscopy were tested under operational conditions at terminal elevators at Thunder Bay in order to determine the accuracy and speed of the testing procedures. The results have been encouraging and the program has been extended to begin testing the accuracy and operational performance of these grain quality analyzers at terminal elevators. Three types of infra-red spectroscopy devices are being tested and, if successful, will eventually replace the present Kjeldahl chemical determination.

Entomology Services. The regional entomology laboratories at Thunder Bay, Ontario, and North Vancouver, B.C., are responsible for infestation and sanitation control within their respective elevator areas by carrying out bi-monthly examinations of each terminal. The 39,000 perimeter and bin samples collected from the 29 terminals were monitored for infestation and the findings supplied to each firm with recommendations when necessary, and to the Plant Protection Division for certification purposes. The incidence of infestations remained at a low level and *Cryptolestes ferrugineus* was the major primary insect intercepted.

Head office staff conducted annual inspections of inland terminals and initiated inspections of some primary elevators. A total of 7,413 cut-off samples from 627 elevator points, submitted by six grain firms, revealed 165 infested bins. During the low winter temperatures, cold weather treatments were successfully carried out at several primary elevators by turning known infested grain until the temperature was down to 20°F. or lower and holding for at least six weeks.

A grain sanitation officer was stationed at Chatham, Ontario, in September, 1973 and the laboratory was completed in early March, 1974. This office is responsible for inspection of licensed terminals in Eastern Ontario, as well as monitoring ship loading samples. The office also gives guidance to elevator operators and producers regarding effective control and treatment measures.

The Commission's entomological units in both Western and Eastern Canada maintained close liaison with the Plant Protection Division of the Department in all phases of their work involving grain storage and transportation.

Monitoring Moisture Meter Performance. The Research Laboratory maintains a bi-weekly program of check tests to monitor the performance on the 126 3-inch cell and the 29 3½-inch cell Model 919 Moisture Meters used by the Grain Inspection Division across Canada for the determination of moisture content in cereal grains and oilseeds. As required, meters are brought in from Inspection Division offices to the Research Laboratory in Winnipeg for necessary servicing and re-calibration.

In addition, during the year, moisture testing equipment and facilities in Inspection Division offices in Vancouver, Calgary, Thunder Bay, Toronto, Chatham and Montreal were inspected at their respective sites. Calibration charts, prepared by the Laboratory in order to permit the 3½-inch cell meter to be used for the determination of moisture content in barley and faba beans, were issued and distributed in 1974. The Laboratory's studies to calibrate the meter for the determination of mois-

ture content in corn were extended this year to moisture levels of about 40%.

Grain Appeal Tribunal. During the crop year 1973-74 a total of 212 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of carlots and trucklots officially inspected in the Western Division. The grades assigned by the Inspection Division were sustained in 175 cases. Most of the samples reviewed by the Tribunal represented shipments of either wheat or barley and covered a wide range of varieties and grades.

Grading Services to Producers. The total number of "Subject to Grade and Dockage" and other unofficial samples inspected for producers and the trade was 38,644; this was an increase from the 37,439 samples inspected during 1972-73. Producers' complaints on special bin barley carlot shipments totalled 12. The Chief Grain Inspector's comparisons of primary delivery samples with final unload samples established that in two cases the identity of the producers' grain had not been preserved in handling through the primary elevator.

Service to Other Organizations. The Economics and Statistics Division functioned as a statistical support agency for the Canadian Wheat Board, by supplying them with all major reports and publications compiled by the Division, particularly those related to country elevator operations and the positioning of grain stocks.

The Division served as the prime source of grain handling statistics pertaining to the licensed elevator system for incorporation in a variety of statistical releases by Statistics Canada. In particular, this office supplied the Agricultural Division of Statistics Canada with the primary material for the joint annual publication, *Grain Trade of Canada*.

Special Acts Administration. The Commission did not find it necessary to establish any maximum freight rates under the provisions of the Inland Water Freight Rates Act.

SECTION 4 — PERSONNEL ADMINISTRATION

Personnel services relating to Canadian Grain Commission staff were provided by the Personnel Administration Branch of Agriculture Canada.

Mr. C. W. Hammond, Chief Grain Inspector and Director of the Grain Inspection Division, retired during November, 1974. Mr. A. Schaen, formerly Deputy Director of the Division, was appointed to succeed Mr. Hammond.

Mr. P. Edwards, formerly Grain Inspector-in-Charge, Winnipeg District, was appointed Chairman of the Grain Appeal Tribunal.

Mr. R. G. McCullough, Assistant Commissioner at Calgary, resigned to accept another appointment.

At December 31, 1974, total staff exclusive of the Canadian Government Elevators, was 890 compared with 905 at the end of 1973. The staff of the Canadian Government Elevators totalled 302, an increase of 97 since December 31, 1973.

APPENDIX A

Grain Statistics and Quality

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A-1 — Supply and Disposition of Canadian Grains, Crop Year 1973-74*

	Wheat**	Oats	Barley	Rye	Flaxseed	Rapeseed	Totals
	— thousands of bushels —						
SUPPLY							
Carry-over July 31, 1973 . . .	365,401	79,679	193,024	10,304	7,673	20,678	676,759
Production in 1973	604,738	326,880	469,570	14,282	19,400	53,200	1,488,070
Imports	—	7,321	—	—	17	—	7,338
Total Supply.	970,139	413,880	662,594	24,586	27,090	73,878	2,172,167
DISPOSITION							
Exports***	419,745	838	127,417	4,584	15,503	39,183	607,270
Domestic use	164,690	335,663	326,767	9,492	3,676	22,309	862,597
Total Disposition	584,435	336,501	454,184	14,076	19,179	61,492	1,469,867
CARRY-OVER (July 31, 1974)							
On farms (estimated)	96,000	58,000	66,000	2,500	1,500	1,500	225,500
In primary, process and terminal elevators	189,690	13,938	120,096	6,762	5,791	9,508	345,785
In store at and afloat to eastern transfer elevators.	69,474	1,850	7,969	882	203	—	80,378
In eastern and western mill bins	3,536	726	—	—	—	—	4,262
In transit by rail — eastern and western divisions . . .	27,004	2,865	14,345	366	417	1,378	46,375
In store and in transit to the United States	—	—	—	—	—	—	—
Total in store July 31, 1974.	385,704	77,379	208,410	10,510	7,911	12,386	702,300

* Subject to revision.

** Wheat includes durum wheat.

*** Includes exports of bulk grain, seed and (except for flaxseed and rapeseed) milled and processed products expressed as grain equivalents.

A-2 — Licences in Force and Storage Capacity, August 1, 1974 and 1973

Type of Licence	Licences in force August 1		Licensed storage capacity August 1	
	1974	1973	1974	1973
Primary Elevator	4,292	4,383	362,272,700	368,026,900
Terminal and Process Elevator	59	57	160,388,710	167,858,210
Transfer Elevator	28	28	124,991,300	124,991,300
Grain Dealer	27	17	*	*
Totals	4,406	4,485	647,652,710	660,876,410

* These licences do not cover grain storage facilities.

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1973-74

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Canada Western Red Spring	125,786	58.2	—
Tough 1 Canada Western Red Spring	1,407	.7	—
2 Canada Western Red Spring	47,092	21.8	—
Tough 2 Canada Western Red Spring	17,866	8.3	—
3 Canada Western Red Spring	8,508	3.9	—
Tough 3 Canada Western Red Spring	11,420	5.3	—
1 Canada Utility	492	.2	—
2 Canada Utility	61	*	—
3 Canada Utility	1,125	.5	—
Tough Others	1,087	.5	—
Damp	1,401	.6	—
Rejected	24	*	—
Others red spring	2	*	—
Total red spring wheat	216,271	100.0	89.1
1 Canada Western Amber Durum	1,656	6.9	—
2 Canada Western Amber Durum	7,156	29.6	—
3 Canada Western Amber Durum	7,768	32.1	—
Extra 4 Canada Western Amber Durum	3,962	16.4	—
4 Canada Western Amber Durum	2,496	10.3	—
5 Canada Western Amber Durum	380	1.6	—
Tough Durum	528	2.2	—
Others Durum	226	.9	—
Total amber durum wheat	24,172	100.0	10.0
Total soft white spring	1,347	—	.5
Total mixed wheat	1	—	*
Total Alberta winter wheat	1,062	—	.4
Total all wheats	242,853	—	100.0

* Less than 0.05%.

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1973-74 (Continued)

Grade	Carlots	Percentage
OATS		
1 Canada Western	1	*
2 Canada Western	29	.3
Extra 3 Canada Western	86	.9
3 Canada Western	1,607	17.5
Extra 1 Feed	1,026	11.2
1 Feed	5,245	57.0
2 Feed	405	4.4
3 Feed	75	.8
Mixed Feed	2	*
Tough	649	7.1
Damp	12	.1
Rejected	15	.2
Others	49	.5
Total oats	9,201	100.0
BARLEY		
1 Canada Western Six-Row	173	.2
2 Canada Western Six-Row	8,479	10.9
3 Canada Western Six-Row	—	—
1 Canada Western Two-Row	232	.3
2 Canada Western Two-Row	6,420	8.2
3 Canada Western Two-Row	—	—
1 Feed	44,932	57.6
2 Feed	4,987	6.4
3 Feed	561	.7
Tough	11,428	14.6
Damp	700	.9
Rejected	115	.1
Others	52	.1
Total barley	78,079	100.0

* Less than 0.05%.

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1973-74 (Continued)

Grade	Carlots	Percentage
RYE		
1 Canada Western	14	.5
2 Canada Western	1,779	60.5
3 Canada Western	935	31.8
4 Canada Western	74	2.5
Ergoty	21	.7
Tough	118	4.0
Damp	1	*
Rejected	—	—
Others	—	—
Total rye	2,942	100.0
FLAXSEED		
1 Canada Western	7,697	95.8
2 Canada Western	128	1.6
3 Canada Western	60	.7
4 Canada Western	7	.1
Tough	98	1.2
Damp	7	.1
Rejected	30	.4
Others	11	.1
Total flaxseed	8,038	100.0
RAPESEED		
1 Canada	17,423	95.7
2 Canada	393	2.2
3 Canada	133	.7
Others	250	1.4
Total rapeseed	18,199	100.0

* Less than 0.05%.

**A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1973-74
(Concluded)**

Grade	Carlots	Percentage
OTHER GRAINS		
Corn	181	-
Sunflower seed	509	-
Mixed grain	160	-
Screenings	355	-
Buckwheat	311	-
Soybeans	-	-
Peas	98	-
Sample grain	7	-
Safflower seed	1	-
Mustard seed	903	-
Condemned grain	18	-
	2,543	-
Grand total	361,855	-

**A-4 — Samples of Western Grain "Subject to Grade and Dockage" and
Other Unofficial Samples Inspected, Crop Year 1973-74,
Compared with Crop Year 1972-73**

Point	1973-74	1972-73
	Number of Samples	
Winnipeg	19,765	17,055
Calgary	8,310	6,228
Edmonton	337	375
Moose Jaw	168	5
Saskatoon	1,523	2,108
Lethbridge	8,541	11,668
Totals	38,644	37,439

A-5 — Inward Carlot and Trucklot Re-inspections of Western Grain, Crop Year 1973-74

Point	Inspected	Re- Inspected	Un- changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	222,663	9,614	8,908	626	20	2	58
Winnipeg	6,061	539	481	52	2	—	4
Churchill	8,974	242	221	18	—	—	3
Moose Jaw	4,940	285	241	42	1	—	1
Saskatoon	14,700	746	661	72	—	6	7
Calgary	4,835	182	163	15	1	1	2
Edmonton	7,138	826	779	37	4	—	6
Lethbridge	9,973	363	342	20	—	—	1
Prince Rupert	8,845	256	246	9	—	—	1
Vancouver	108,312	4,141	3,725	372	10	8	26
Totals	396,441	17,194	15,767	1,263	38	17	109
Percentage of total carlots and trucklots	100.0	4.3	4.0	.3	*	*	*

* Less than 0.05%.

A-6 — Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1973-74

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	234	6,377	61	610	517
Oats	231	2,981	3	7	3
Barley	226	5,200	96	341	76
Flaxseed	-	1,170	108	195	98
Rye	4	133	-	-	-
Mixed Grain	17	60	-	2	-
Corn	-	-	-	-	-
Buckwheat	-	1	-	-	-
Peas	-	1	-	-	-
Screenings	131	3,886	21	58	18
Rapeseed	-	854	99	341	4
Sample feed grain	-	-	-	-	-
Mustard seed	-	12	6	9	82
Sample grain	41	69	-	-	-
Sunflower	-	9	-	-	7
Totals	884	20,753	394	1,563	805

Grain	Saskatoon	Lethbridge	Vancouver, Victoria and Prince Rupert	Churchill
Wheat	1,448	1,806	623	-
Oats	31	-	548	-
Barley	1,207	-	1,040	-
Flaxseed	3	-	17	-
Rye	-	-	1	-
Mixed grain	8	-	30	-
Corn	-	-	1	-
Buckwheat	-	-	-	-
Peas	-	-	-	-
Screenings	222	16	797	-
Rapeseed	1,021	1	14	-
Sample feed grain	8	-	-	-
Mustard seed	87	28	1	-
Sample grain	2	-	2	-
Canary seed	6	-	-	-
Sunflower	-	-	-	-
Totals	4,043	1,851	3,074	-

A-7 — Carlot Inspections of Eastern Grain, Crop Year 1973-74

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
1 Canada Eastern White Winter	-	-	200	200
2 Canada Eastern White Winter	25	-	419	444
3 Canada Eastern White Winter	-	-	63	63
4 Canada Eastern White Winter	-	-	9	9
Tough	-	-	79	79
Damp	-	-	1	1
Sample	-	-	2	2
Totals	25	-	773	798
BARLEY				
2 Canada Eastern Two-Row	-	-	2	2
1 Feed	-	-	2	2
Totals	-	-	4	4
CORN				
Extra Dry 1 Canada Eastern Yellow	-	-	50	50
1 Canada Eastern Yellow	-	-	79	79
Extra Dry 2 Canada Eastern Yellow	-	-	176	176
2 Canada Eastern Yellow	-	-	174	174
Extra Dry 3 Canada Eastern Yellow	-	-	79	79
3 Canada Eastern Yellow	2	-	52	54
Extra Dry 4 Canada Eastern Yellow	-	-	20	20
4 Canada Eastern Yellow	1	-	5	6
Extra Dry 5 Canada Eastern Yellow	-	-	5	5
5 Canada Eastern Yellow	2	-	3	5
Tough	1	-	16	17
Sample	5	-	8	13
Totals	11	-	667	678

**A-7 — Carlot Inspections of Eastern Grain, Crop Year 1973-74
(Continued)**

Grade	Montreal	Toronto	Chatham	Total
BEANS				
Extra 1 Canada Eastern Pea	—	—	3	3
1 Canada Eastern Pea	—	—	26	26
2 Canada Eastern Pea	3	—	1	4
3 Canada Eastern Pea	—	—	1	1
1 Canada Eastern Light Red Kidney	—	—	2	2
Totals	3	—	33	36
SOYBEANS				
1 Canada Yellow	—	—	120	120
2 Canada Yellow	—	—	291	291
3 Canada Yellow	—	—	18	18
Tough	—	—	116	116
Damp	—	—	10	10
Totals	—	—	555	555
Totals, all grains	39	—	2,032	2,071

**A-8 — Inspections of Eastern Grain in Cargoes, Bins, Trucks or
Warehouses, Crop Year 1973-74**

Grain	Montreal	Toronto	Chatham	Total
	— bushels —			
Wheat	240,113	886	4,297,199	4,538,198
Corn	—	7,181	1,364,044	1,371,225
Beans	—	—	1,371,302	1,371,302
Peas	10,666	—	—	10,666
Soybeans	83,729	—	744,973	828,702
Totals	334,508	8,067	7,777,518	8,120,093

A-9 — Inward and Export Cargoes Sampled and Inspected, Crop Year 1973-74

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Baie Comeau	Port Cartier	Total
				— bushels —				
Eastern grain								
Inward	778,404	—	—	—	—	—	—	778,404
Export	820,255	—	—	670	—	22,526	185,761	1,029,212
Western grain								
Inward	140,069	—	—	—	—	—	—	140,069
Export	71,731,803	14,339,499	21,964,375	40,386,887	22,307,216	41,683,409	57,966,866	270,380,055
Totals	73,470,531	14,339,499	21,964,375	40,387,557	22,307,216	41,705,935	58,152,627	272,327,740

A-10 — Grain Sampled but not Inspected, Crop Year 1973-74

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern grain							
Carlots.	73	-	-	-	-	-	73
Inward cargoes (bu.) . .	-	-	-	-	-	-	-
Outward cargoes (bu.) .	-	-	-	-	-	-	-
Bin lots (bu.).	337,787	-	-	-	-	-	337,787
Western grain							
Carlots.	-	-	-	-	-	-	-
Inward cargoes (bu.) . .	6,569,876	-	-	-	-	-	6,569,876
Outward cargoes (bu.) .	-	-	-	-	-	-	-
Bin lots (bu.).	-	-	6,250	-	-	-	6,250
U.S.A. grain							
Carlots.	2	-	-	-	-	-	2
Inward cargoes (bu.) . .	2,821,151	-	-	-	-	-	2,821,151
Outward cargoes (bu.) .	4,400,582	-	17,802,493	26,509	33,812,647	42,027,993	98,070,224
Bin lots (bu.).	409,343	-	-	-	-	-	409,343
Totals — cars	75	-	-	-	-	-	75
bushels	14,538,739	-	17,808,743	26,509	33,812,647	42,027,993	108,214,631

A-11 — Quantities of Grain Inspected and Weighed at Terminal Elevators Crop Year 1973-74

Point	Wheat	Durum	Oats	Barley	Rye
RECEIPTS					
	— bushels —				
Thunder Bay	279,940,987	44,998,851	26,091,418	117,200,326	4,028,489
Vancouver	144,403,773	7,833,724	74,950	41,424,366	2,389,047
Victoria	5,920,620	—	—	—	—
Prince Rupert	18,155,620	—	—	—	—
Churchill	7,956,032	—	—	11,415,676	—
Calgary	330,793	6,615	57,804	2,817,977	59,252
Edmonton	2,033,665	4,565	4,427	2,589,241	—
Lethbridge	6,771,971	—	108,937	193,766	164,612
Moose Jaw	365,364	2,009,522	—	738,871	519
Saskatoon	4,277,104	3,647	210,152	3,673,713	—
Total	470,155,929	54,856,924	26,547,688	180,053,936	6,641,919
SHIPMENTS					
	— bushels —				
Thunder Bay	271,858,866	45,131,700	25,386,986	113,917,740	4,279,656
Vancouver	142,367,077	7,535,417	72,593	41,309,802	2,065,559
Victoria	5,674,150	—	—	3,281	—
Prince Rupert	17,539,940	—	—	—	—
Churchill	9,798,551	—	—	9,047,575	—
Calgary	300,873	6,615	21,744	2,138,670	49,279
Edmonton	1,964,543	4,565	3,742	899,364	—
Lethbridge	6,027,092	—	86,594	194,036	101,200
Moose Jaw	183,050	1,245,068	—	473,298	—
Saskatoon	4,058,947	7,752	77,069	2,642,053	—
Total	459,773,089	53,931,117	25,648,728	170,625,819	6,495,694

**A-11 — Quantities of Grain Inspected and Weighed at Terminal Elevators,
Crop Year 1973-74
(Continued)**

Point	Flaxseed	Rapeseed	Buckwheat	Mustard Seed	Peas	Miscel- laneous
RECEIPTS						
			— bushels —			
Thunder Bay.	11,250,702	5,794,440	—	1,190,506	116,580	1,357,020
Vancouver.	5,379,794	34,216,949	701,136	538,463	—	22,762
Victoria	—	—	—	—	—	—
Prince Rupert	—	431,896	—	—	—	—
Churchill.	—	—	—	—	—	—
Calgary	361,840	391,015	—	16,514	—	477,967
Edmonton	372,495	836,973	—	21,886	—	226
Lethbridge.	2,162	—	—	27,188	—	254,057
Moose Jaw	253,256	16,890	—	320,640	—	18,192
Saskatoon	18,336	2,477,104	—	237,260	—	1,047
Total	17,638,585	44,165,267	701,136	2,352,457	116,580	2,131,271
SHIPMENTS						
			— bushels —			
Thunder Bay.	10,985,057	8,483,654	1,237	1,033,172	76,000	1,361,831
Vancouver.	5,055,151	32,283,455	646,039	544,279	—	—
Victoria	—	—	—	—	—	1,640
Prince Rupert	—	432,932	—	—	—	16,224
Churchill.	—	—	—	—	—	—
Calgary	322,175	316,173	—	14,549	—	477,794
Edmonton	536,468	1,021,057	—	19,692	—	1,110
Lethbridge.	2,427	—	—	21,437	—	217,507
Moose Jaw	213,529	8,583	—	251,723	—	18,181
Saskatoon	6,158	2,180,835	—	191,108	—	—
Total	17,120,965	44,726,689	647,276	2,075,960	76,000	2,094,287

**A-12 — Carlots Weighed, Leaking or with Defective Seals, in the
Western Division
Crop Years 1972-73 and 1973-74**

	Number		% of Total	
	1973-74	1972-73	1973-74	1972-73
Cars weighed in	341,501	458,019	100.0	100.0
Inward leaks	24,741	32,054	7.2	7.0
Inward seals missing or defective	8,789	25,485	2.6	5.6
Cars weighed out	23,877	21,747	-	-

**A-13 — Average Reported Outturn Shortage on Vessel Shipments of Grain
from Thunder Bay to Licensed Transfer Elevators, Crop Year 1973-74**

Grain	Bushels Shipped	Shortage in pounds per 1000 bushels	
		1973-74	1972-73
Wheat	247,625,904	40.46	41.94
Durum Wheat	42,047,704	40.38	39.67
Oats	15,078,836	25.50	23.96
Barley	83,572,313	39.68	38.26
Rye	1,736,602	42.51	43.76
Flaxseed	1,919,116	43.97	22.96
Rapeseed	431,047	75.18	44.83
Screenings (in tons).	117,451	1.54/ton	2.11/ton

A-14 — Tough and Damp Grain Dried at Terminal Elevators, Crop Year 1973-74

	Artificial drying			Natural drying	Total
	Tough	Damp	Total		
	— bushels —				
Thunder Bay					
Wheat	22,515,244	766,312	23,281,556	8,580,149	31,861,705
Durum	66,000	5,293	71,293	535,058	606,351
Oats	93,332	27,638	120,970	1,039,447	1,160,417
Barley	3,930,953	705,085	4,636,038	9,236,631	13,872,669
Rye	—	—	—	139,921	139,921
Flaxseed	17,550	4,991	22,541	117,767	140,308
Rapeseed	5,305	3,507	8,812	3,958	12,770
Buckwheat	—	—	—	—	—
Sunflower Seed *	28,099	—	28,099	12,119	40,218
Mixed Grain **	—	56,126	56,126	—	56,126
Total	26,656,483	1,568,952	28,225,435	19,665,050	47,890,485
Pacific Coast					
Wheat	20,659,110	1,800,200	22,459,310	4,990,913	27,450,223
Durum	—	2,169	2,169	68,125	70,294
Oats	—	—	—	—	—
Barley	6,120,250	814,858	6,935,108	2,067,410	9,002,518
Rye	—	2,465	2,465	48,581	51,046
Flaxseed	—	9,091	9,091	15,929	25,020
Rapeseed	—	—	—	69,832	69,832
Buckwheat	—	—	—	25,435	25,435
Sunflower Seed *	—	—	—	—	—
Total	26,779,360	2,628,783	29,408,143	7,286,225	36,694,368
Interiors					
Wheat	3,156,395	156,434	3,312,829	9,335	3,322,164
Durum	—	—	—	775	775
Oats	—	4,006	4,006	—	4,006
Barley	1,617,443	65,770	1,683,213	24,134	1,707,347
Rye	233	—	233	7,501	7,734
Flaxseed	—	—	—	4,012	4,012
Rapeseed	—	4,176	4,176	9,318	13,494
Mustard Seed	—	—	—	20,842	20,842
Sunflower Seed *	—	—	—	—	—
Corn	8,612	61,269	69,881	—	69,881
Total	4,782,683	291,655	5,074,338	75,917	5,150,255
Churchill					
Wheat	—	—	—	14,971	14,971
Barley	—	—	—	75,934	75,934
Total	—	—	—	90,905	90,905
Total all locations	58,218,526	4,489,390	62,707,916	27,118,097	89,826,013

* 30 pounds/bushel.

** 50 pounds/bushel.

A-15 — Quality Data for Grades of Red Spring Wheat Exported, Crop Year 1973-74

	1 C.W. Red Spring		2 C.W. Red Spring			3 C.W. Red Spring	
	13.5	12.5	13.5	12.5	11.5	*	*
Test weight, Avery, lb./bu.	66.8	67.0	64.6	65.0	65.7	65.5	62.9
1000 kernel weight, g.	28.8	29.5	27.8	28.4	29.8	29.3	29.6
Wheat protein content, %**	13.8	13.0	13.7	12.9	12.0	13.2	12.8
Falling number, sec.	425	405	310	380	385	370	—
Flour protein content, %***	13.0	12.1	12.9	12.1	11.2	12.3	11.8
Flour yield, %	75.1	74.7	75.5	75.7	75.3	75.4	74.5
Flour ash content, %	0.45	0.46	0.47	0.49	0.49	0.48	0.50
Flour diastatic activity, mg.	179	180	201	201	193	203	241
Baking absorption, %	62.0	61.0	61.0	61.0	60.0	61.0	60.0
Loaf volume, cc.	855	795	855	800	755	795	730

* Not segregated by protein content.
 ** 13.5% moisture basis.
 *** 14.0% moisture basis.

A-16 — Carlot Inspections Appealed, Crop Year 1973-74

Item	Carlots	Percentage
Left as graded	175	82.5
Grades raised	34	16.0
Grades lowered	2	1.0
Dockage lowered	1	.5
Totals	212	100.0

A-17 — Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1974

Port of Discharge	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed
— cents per bushel —						
Georgian Bay Ports, Goderich, Sarnia and Walkerville	8.10	9.09	9.03	9.98	—	—
Port Colborne	9.74	11.5	—	—	—	—
Toronto	11.41	10.6	13.56	11.25	12.4	—
Kingston	10.63	—	—	—	—	—
Prescott	13.35	12.03	12.63	—	—	—
Montreal	12.64	11.13	11.84	12.81	—	—
Sorel	12.5	12.75	12.19	—	—	—
Three Rivers	12.54	12.25	12.31	12.5	—	—
Quebec	12.59	11.01	11.81	12.5	13.5	—
Baie Comeau	12.5	—	11.86	—	—	—
Port Cartier	12.5	—	11.75	—	—	—
Halifax	22.33	—	21.25	—	—	—
Other Maritime	45.0	35.0	45.0	—	—	—
Buffalo	18.43	—	16.0	—	—	—
Manitowoc	—	—	12.0	—	—	—
Milwaukee	—	—	12.72	—	—	—
Oswego	—	—	16.0	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

Schedule C was amended, effective April 15, 1974, to increase the maximum rates for drying wheat and some other kinds of grain at licensed terminal elevators.

Schedule D was amended, effective June 1, 1974, to increase the maximum basic elevation rates for licensed transfer elevators in the Eastern Division. The amendment also increased the maximum storage rate for these elevators from 1/25¢ to 1/20¢ per bushel per day.

Schedule B was amended, effective August 1, 1974, to provide a revised maximum tariff for licensed primary elevators, including an elevation rate of 10½¢ per bushel for all kinds of grain.

Schedule C "Maximum Tariff — Terminal Elevators" was further amended and revised, effective August 1, 1974. The new schedule included an increase of ½¢ per bushel in the rates for elevation.

Several minor amendments were made to the Regulations at that date to coincide with the revision of maximum tariffs.

Schedule A was amended, effective November 1, 1974, to implement an increase of approximately 50% in the fees charged by the Commission for inspection, weighing and other related services.

A new section was added on September 24, 1974 to facilitate the segregation at primary elevators of varieties of rapeseed which contain high or low levels of erucic acid.

Western Grain Standards Committee as at December 31, 1974

H. D. Pound	Chief Commissioner	} Canadian Grain Commission
A. Schaen	Chief Grain Inspector	
Dr. G. N. Irvine	Chief Chemist	
P. Edwards	Chairman, Grain Appeal Tribunal	
Dr. J. W. Morrison	} representing the Canada Department of Agriculture	
J. B. Russell		
C. W. Gibbings	representing the Canadian Wheat Board	
N. H. McClure	} representing processors of grain	
W. W. Sisler		
G. E. Gould	} representing exporters of grain	
R. K. Lester		
John I. Miller	} representing producers of western grain	
R. E. Hadland		
Hubert N. Anderson		
H. R. Patching		
Elmer Kure		
Gordon South		
Devone R. Clark		
Avery K. Sahl		
Frank Dietz		
D. E. Campbell		
Wm. A. Ronald		
A. Bos		

Eastern Grain Standards Committee as at December 31, 1974

H. D. Pound	Chief Commissioner	} Canadian Grain Commission
A. Schaen	Chief Grain Inspector	
Dr. G. N. Irvine	Chief Chemist	
Dr. J. W. Morrison	representing the Canada Department of Agriculture	
J. P. Levesque	} representing processors and exporters of grain	
C. F. Bowker		
F. J. Reid		
M. Pardo		
M. R. McDougall	} representing producers of eastern grain	
Clarence Wilson		
Gus Sonneveld		
Kenneth Patterson		
Fernand Beaudet	} additional*	
E. M. Jones		
G. C. Nichols		

* Appointed pursuant to Section 17 (3) (e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Red Spring Wheat Crop Bulletin</i>	Annually
<i>Canadian Amber Durum Wheat Crop Bulletin</i>	Annually
<i>Canadian Barley Crop Bulletin</i>	Annually
<i>Canadian Flax and Rapeseed Crop Bulletin</i>	Annually
<i>Canadian Wheat Cargoes Bulletin</i>	Quarterly
<i>Canadian Durum Cargoes Bulletin</i>	Quarterly
<i>Map of Western Canada Showing the Protein Content of Hard Red Spring Wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Grain Grading Handbook for Western Canada</i>	
<i>Varietal Identification of Barley, Wheat and Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain through a Primary Elevator</i>	
<i>The Key to Canada's Certificate Final is Uniform Quality</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1974 Annual Report.

APPENDIX D

Revenue and Expenditure

Earned revenue and net expenditure of the Commission, including the Canadian Government Elevators, for the fiscal year 1973-74, compared with 1972-73, were as follows:

	1973-74	1972-73
Revenue	\$10,895,778	\$11,644,057
Expenditure	16,956,099	15,141,772

Further information is given in the following tables.

D-1 — Earned Revenue and Net Expenditure, by Points and Divisions, Fiscal Year Ended March 31, 1974

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
				— dollars —			
Winnipeg *	1,167	76,003	47,560	174,905	1,992	4,822,453	5,124,080
Churchill	—	79,906	42,586	—	—	—	122,492
Saskatoon	—	40,201	40,722	—	—	—	80,923
Moose Jaw	—	10,107	5,038	—	—	—	15,145
Lethbridge	—	19,505	1,638	—	—	—	21,143
Calgary	—	27,108	34,354	—	—	—	61,462
Edmonton	—	9,223	2,806	—	—	—	12,029
Vancouver	—	1,233,321	626,876	88,476	—	—	1,948,673
Victoria	—	24,861	11,940	—	—	—	36,801
Prince Rupert	—	90,674	44,856	—	—	—	135,530
Thunder Bay	—	2,087,442	1,059,799	33	—	—	3,147,274
Toronto	—	15,024	—	—	—	—	15,024
Chatham	—	63,303	—	—	—	—	63,303
Montreal	—	26,863	—	27,513	—	—	54,376
Baie Comeau	—	19,482	18,565	—	—	—	38,047
Port Cartier	—	6,716	6,033	—	—	—	12,749
Quebec	—	6,727	—	—	—	—	6,727
Totals	1,167	3,836,466	1,942,773	290,927	1,992	4,822,453	10,895,778

Note: * Revenue and Expenditure for all Government Elevators shown opposite Winnipeg.

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Super annuation	Total
EXPENDITURE								
				— dollars —				
Winnipeg *	505,770	1,438,995	231,628	631,767	1,682,249	4,049,869	1,038,000	9,578,278
Churchill	—	13,903	12,491	—	—	—	—	26,394
Saskatoon	22,698	120,664	41,771	—	—	—	—	185,133
Moose Jaw	—	42,375	—	—	—	—	—	42,375
Regina	30,948	—	—	—	—	—	—	30,948
Lethbridge	—	44,211	—	—	—	—	—	44,211
Calgary	35,205	336,984	48,705	—	—	—	—	420,894
Edmonton	—	60,984	—	—	—	—	—	60,984
Vancouver	—	915,064	702,625	205,316	—	—	—	1,823,005
Victoria	—	42,706	33,142	—	—	—	—	75,848
Prince Rupert	—	66,653	51,564	—	—	—	—	118,217
Thunder Bay	—	2,105,411	1,379,256	233,040	—	—	—	3,717,707
Toronto	—	22,835	—	—	—	—	—	22,835
Chatham	—	148,078	—	—	—	—	—	148,078
Montreal	—	427,096	20,605	46,458	—	—	—	494,159
Baie Comeau	—	54,395	19,276	—	—	—	—	73,671
Port Cartier	—	39,764	—	—	—	—	—	39,764
Quebec	—	41,152	—	—	—	—	—	41,152
Harrow	12,446	—	—	—	—	—	—	12,446
Totals	607,067	5,921,270	2,541,063	1,116,581	1,682,249	4,049,869	1,038,000	16,956,099

Note: * Revenue and Expenditure for all Government Elevators shown opposite Winnipeg.

**D-2 — Summary of Operations by Divisions,
Fiscal Year Ended March 31, 1974**

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
	— dollars —						
Fees	—	3,773,770	1,926,192	290,854	—	—	5,990,816
Overtime.	—	38,557	16,530	—	—	—	55,087
Express Charges	—	2,481	—	—	—	—	2,481
Samples Sold	—	21,321	—	—	—	—	21,321
Refund of Previous Year's Expenditures	482	268	51	73	492	—	1,366
Miscellaneous	685	69	—	—	1,500	—	2,254
Grain Handling Charges	—	—	—	—	—	4,822,453	4,822,453
Totals	1,167	3,836,466	1,942,773	290,927	1,992	4,822,453	10,895,778

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Super- annuation	Total
EXPENDITURE								
	— dollars —							
Personnel Costs	376,014	4,959,439	2,402,433	759,558	820,440	2,005,618	1,038,000	12,361,502
Travel	44,035	126,557	82,768	22,439	23,571	33,586	—	332,956
Postage, Freight and Cartage	4,889	129,203	2,502	8,000	16,885	5,733	—	167,212
Telephone and Telegraph	13,586	48,243	8,223	29,062	9,113	28,623	—	136,850
Advertising	843	17	—	—	—	—	—	860
Departmental Publications	1,609	—	—	9,384	7,462	—	—	18,455
Professional and Special Services	18,776	13,791	615	4,823	17,178	32,183	—	87,366
Rent—Buildings	114,864	263,942	29,436	116,202	452,881	19,776	—	997,101
—Equipment	3,305	3,627	591	112,615	4,583	3,068	—	127,789
Purchased Repair and Upkeep								
—Buildings and Works	115	16,232	597	879	5,598	146,301	—	169,722
—Equipment	1,154	10,634	383	2,134	22,645	33,746	—	70,696
Utilities.	362	5,088	494	2,930	3,684	183,211	—	195,769
Grants in Lieu of Taxes	—	—	—	—	—	423,788	—	423,788
Screenings	—	—	—	—	—	234,563	—	234,563
Printing and Stationery	15,743	28,524	6,984	19,731	6,174	7,583	—	84,739
Other Materials and Supplies	3,482	91,998	2,125	3,547	97,992	173,690	—	372,834
Grants and Contributions	—	—	—	—	1,097	—	—	1,097
Construction/ Acquisition Bldgs.	—	125	—	—	—	380	—	505
Office Equipment	8,290	15,245	2,973	14,383	25,068	6,598	—	72,557
Other Capital Equipment	—	208,605	939	10,894	167,878	711,422	—	1,099,738
Totals	607,067	5,921,270	2,541,063	1,116,581	1,682,249	4,049,869	1,038,000	16,956,099

APPENDIX E

CANADIAN GRAIN COMMISSION

GRAIN APPEAL TRIBUNAL Chairman: P. Edwards		EXECUTIVE DIRECTOR E. E. Baxter Financial Officer		ASSISTANT COMMISSIONERS Winnipeg 2 Regina 2 Saskatoon 2 Calgary 2 Harrow 1 R. Clark 1	
Chief Commissioner H. D. Pound Commissioner C. L. Shuttleworth Commissioner F. M. Hetland		ECONOMICS & STATISTICS Director L. C. Rayner		RESEARCH LABORATORY Director Dr. G. N. Irvine	
WEIGHING Director J. S. T. Swanson		GOVT. ELEVATORS General Manager W. E. Turner			
INSPECTION Director A. Schaen		Winnipeg 83 Montreal 28 Chatham 13 Toronto 2 Thunder Bay 182 Saskatoon 14 Moose Jaw 4 Lethbridge 7 Calgary 23 Edmonton 14 Vancouver 80 Victoria 7 Prince Rupert 7 Baie Comeau 3 Port Cartier 3 Three Rivers 1 Sorel 1 Quebec 3 475		Winnipeg 13 Saskatoon 60 Moose Jaw 45 Lethbridge 45 Calgary 36 Edmonton 46 Prince Rupert 57 302	
Winnipeg 14 Montreal 2 Thunder Bay 120 Saskatoon 4 Calgary 4 Vancouver 64 Victoria 3 Prince Rupert 5 Baie Comeau 1 Abbotsford 1 218		Winnipeg 36 Montreal 5 Thunder Bay 25 Vancouver 20 86		Winnipeg 78 78	

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Report of the

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CANADIAN

GRAIN

COMMISSION

1975



AGRICULTURE
CANADA

Minister
Hon. Eugene Whelan

Deputy Minister
L. D. Hudon

Report of the

CANADIAN

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1975



AGRICULTURE
CANADA

Minister
Hon. Eugene Whelan

Deputy Minister
L. D. Hudon

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CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba
February 27, 1976.

The Honourable Eugene Whelan, M.P.,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

We are pleased to submit the 1975 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act.

The report contains a review of the Commission's principal activities during the year, together with information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1974-75 crop year, and a review of the quality of 1975 grain crops.

Respectfully submitted,

H. D. Pound,
Chief Commissioner.

C. L. Shuttleworth,
Commissioner.

George G. Leith,
Commissioner.

R. S. Allen
Corresponding Secretary

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INTRODUCTION

The Canadian Grain Commission is responsible for administering the Canada Grain Act and has general supervision over grain handling in Canada. It has the power to make regulations and orders that are consistent with the Act.

The Executive Division deals with policy and general administrative matters, provides financial and office services to all divisions.

The Inspection Division provides official inspection and grading of grain at various points across Canada, particularly grain received at and shipped from terminal elevators, and grain loaded to vessels for export at transfer elevators.

The Weighing Division is responsible for official weighing of grain at terminal, transfer and process elevators, weigh-overs of grain stocks, and also inspection and certification of scales in terminal and transfer elevators.

The Economics and Statistics Division conducts economic research, publishes complete data on the storage and handling of grain within the licensed elevator system, provides regulatory services of licensing and bonding of elevators and grain dealers plus the registration of terminal and transfer elevator receipts, and provides documentation services to the industry for all grain unloads at licensed terminal elevators.

The Research Laboratory carries on a program of research related to the quality of cereal grains and oilseeds, conducts quality surveys of current crops and shipments, and tests new varieties in collaboration with plant breeders and the Commission's Inspection Division.

The Canadian Government Elevators system, which is managed, operated and maintained by the Commission, is comprised of five inland terminals and one seaboard terminal.

The Assistant Commissioners, acting as representatives of the Commission, supervise the licensed primary elevators, deal with producer enquiries and complaints and attend farm meetings relating to the handling and quality control of grains and oilseeds.

In addition, the Commission constitutes Grain Appeal Tribunals, and Western and Eastern Grain Standards Committees. It administers the Grain Futures Act which involves supervision of grain futures trading, and also has responsibility for setting maximum lake grain freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

SECTION 1— GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1974-75

Handlings of Canadian grains and oilseeds during the 1974-75 crop year generally declined as compared with the volumes attained in the late 1960's and early 1970's.

The total supply of wheat, durum wheat, oats, barley, rye, flaxseed and rapeseed totalled 1,920.8 million bushels for the period under review—a decrease of 251.4 million bushels from the previous year and the lowest volume since the 1962-63 crop year. This decline was chiefly due to the 1974 field crop production which dropped 17%. Total stocks carried over into the 1974-75 crop year was 687.3 million bushels of which 31% was located in store on farms.

Producers' marketings of major cereal grains and oilseeds to the licensed elevator system totalled 748.7 million bushels—137.4 million below the 1973-74 total and the lowest level of marketings since the 1969-70 crop year (669.9 million).

Exports of the principal Canadian grains, oilseeds and their by-products totalled 575.9 million bushels—a decrease of 31.4 million bushels from last year, the decline in oilseed clearances accounting for 57% of the total reduction. Wheat and rapeseed exports (including by-products) 394.6 million and 26.1 million bushels respectively, were the smallest since 1969-70.

Disposition of major grains and oilseeds totalled 1,324.0 million bushels—down 10% from the 1973-74 crop year and the lowest on record since the 1968-69 crop year (1,087.0 million). Domestic utilization in Canada for feed, seed, human food and industrial usage accounted for 748.1 million bushels—also the lowest in the past five years. Combined with exports of 575.9 million bushels, this left a carry-over on July 31, 1975 of 596.8 million bushels—90.5 million less than a year earlier.

Quality of Grain Marketed in 1974-75

Red Spring Wheat. The volume of red spring wheat marketed in western Canada during the crop year amounted to 364.5 million bushels (9.9 million metric tonnes), a marked reduction from the 476.3 million bushel (13.0 million metric tonnes) level of marketings in the previous crop year. During the crop year under review, slightly over 31% of the railroad carlot movement of red spring wheat qualified for the top grade No. 1 Canada Western; 16% qualified for the grade No. 2 Canada Western and 14.5% for the grade No. 3 Canada Western. Over 17.6% of country elevator carlot shipments of red spring wheat were graded tough and damp.

The predominant grade of red spring wheat exported from Atlantic ports during the crop year was No. 1 Canada Western at a protein level of 13.5% followed in order by No. 2 Canada Western 12.5%, No. 3 Canada Western, No. 1 Canada Western at 12.5% and No. 2 Canada Western at 13.5%. A small quantity of No. 2 Canada Western wheat at 11.5% protein was shipped in the

first half of the crop year. At the Pacific Coast, the predominant grade in the exports was No. 1 Canada Western 13.5% protein followed in order by No. 3 Canada Western, No. 2 Canada Western unsegregated as to protein level with lesser amounts of No. 2 Canada Western 12.5% protein, No. 1 Canada Western 12.5% protein and No. 2 Canada Western 13.5% protein. Test weight values were down fractionally from the previous crop year for Atlantic shipments but baking absorption and loaf volume were slightly higher in the 1974-75 year. For Pacific exports, test weight and flour yield values were equal to or better than those for the previous crop year. Baking absorption values were better generally and loaf volumes approximated those of the previous crop year.

Amber Durum Wheat. The amber durum wheat movement in the 1974-75 crop year totalled 48.3 million bushels (1.3 million metric tonnes), a very slight increase from the previous crop-year figure of 47.7 million bushels (1.3 million metric tonnes). Nearly 24% of the carlot movement of durum wheat during the crop year graded No. 1 and No. 2 Canada Western; 19% graded No. 3 C.W.; 11.6% Extra No. 4 C.W. and 23% No. 4 C.W. Nearly 7.6% of the durum wheat movement was classed tough. Test weight and 1,000-kernel weight were slightly lower this year than last for virtually all grades. Wheat pigment levels were significantly higher this year for all grades reflecting the presence of the highly pigmented variety Wascana in commercial shipments. Spaghetti colour levels were generally satisfactory this year for all grades even though for the grades Extra No. 4 and No. 5 C.W., the colour was somewhat below that of previous years.

Export shipments of amber durum wheat from Atlantic ports were lower in test weight and 1,000-kernel weight this year than last. Pigment levels in the semolina and in the spaghetti were higher for all grades this year and spaghetti was generally slightly better in colour. Pacific exports of durum wheat represented just under 15% of the total for the grades Nos. 3, 4 and 5 Canada Western which represented the bulk of Pacific shipments. Test weight and 1,000-kernel weight tended to be lower than in Atlantic shipments. Pigment levels in the semolina and spaghetti also tended to be lower than in Atlantic shipments and spaghetti colour also slightly poorer.

Barley. Barley marketings in Canada in the 1974-75 crop year totalled 209.2 million bushels (4.6 million metric tonnes), considerably lower than in the previous year. Malting barley exports during the crop year totalled 11.4 million bushels of which 6.2 million bushels (0.1 million metric tonnes), was two-row barley. The proportion of the carlot movement of barley qualifying for the Canada Western or malting grades was particularly low this year; less than 6% entered the six-row grades, while about 3.5% entered the two-row grades. No. 1 Feed was the predominant grade, accounting for 55.5% of the year's movement; 20% of the carlots of barley were graded tough or damp.

The two-row, six-row and No. 1 Feed Barley marketed in the 1974-75 crop year were somewhat lower in test weight than the previous crop year, but the percentage of plump barley was up significantly for the six-row and the No. 1 Feed grade. The enzymatic activity was higher for the barley marketed in the current crop year than in the previous year.

Oats. The volume of oats marketed in the crop year (40.3 million bushels) increased by 6% over the previous year. The quality was little changed this year, with 19.3% of the carlots grading No. 3 C.W. or higher.

Rye. The predominant grade of the carlot movement of rye in the 1974-75 crop year was No. 2 C.W. which represented nearly 71% of the total. The

volume of the total movement to terminals was 2,794 carlots, a reduction of about 5% over the previous year.

Flaxseed. The amount of flaxseed moved forward from primary country elevators to market position in the 1974-75 crop year, 10.8 million bushels (0.27 million metric tonnes), was about one-third lower than the movement in the previous crop year. The predominant grade, No. 1 C.W. represented over 83% of the carlot movement, a much smaller proportion than usual, reflecting the poor 1974 harvest conditions. Oil content of the No. 1 C.W. Flaxseed averaged 43.3% (dry basis) compared with the level of 42.4% for the previous crop year. The protein content of the oil-free flaxseed meal for the predominant grade averaged 39.4%.

Rapeseed. The volume of the rapeseed movement in the 1974-75 crop year was 41.2 million bushels (0.93 million metric tonnes), slightly below the level of the movement in the previous crop year. No. 1 Canada Rapeseed comprises 91.8% of the total carlot movement. The oil content of the rapeseed marketed in the crop averaged 40.9% (8.5% moisture basis), one percentage unit higher than for the previous crop year. The protein content of the oil-free rapeseed meal averaged 35.0% this year, compared with the level of 35.7% for the previous year. The erucic acid content of the oil in the crop year movement averaged 6.3%. A smaller proportion of high erucic acid rapeseed varieties in the crop year movement has contributed to the lowering of the erucic acid content from the 12.1% level for the previous crop year.

Domestic Mustard Seed. The carlot movement of mustard seed decreased from the 1973-74 crop year level of 903 carlots to 784 carlots in the 1974-75 crop year. The large majority of mustard seed was graded into the No. 1 and No. 2 Yellow, No. 1 and 2 Oriental and No. 1 and 2 Brown grades.

Domestic Buckwheat. A total of 190 carlots were inspected in 1974-75, as compared to 311 during the 1973-74 crop year, a decrease of 39%.

Eastern White Winter Wheat. A total of 794 carlots were inspected during the 1974-75 crop year, a decrease of 4 carlots from the 1973-74 crop year total. Approximately 81% of the wheat qualified for the No. 1 and No. 2 Canada Eastern White Winter grades. The No. 2 C.W. White Winter grade accounted for 575 carlots; an increase of 131 carlots over the previous year's figure. The total number of carlots graded into the No. 1 C.E. White Winter grade declined from 200 carlots in the 1973-74 crop year to 75 carlots in 1974-75.

Eastern Corn. Corn inspections decreased by 23% to 523 carlots from the 1973-74 figure of 678 carlots. The predominating grade was No. 3 C.E. Yellow. It accounted for 31% of the total carlot inspections. During the 1973-74 crop year, 44.9% of the total corn inspected was graded No. 1 and No. 2 Canada Eastern Yellow.

Eastern Soybeans. The carlots of soybeans inspected decreased from a figure of 2,071 for the 1973-74 crop year, to a total of 1,724; a decrease of 17%. Soybeans quality was generally quite good; 92% of the carlots were graded No. 1 or 2 Canada Yellow.

Eastern Pea Beans. Carlots inspections of pea beans increased slightly. Quality was generally quite good, with 44% qualifying for the No. 1 Canada Eastern Pea grade.

Growing Conditions, Grades and Quality, 1975 Crop

The winter of 1974-75 was generally warmer and drier than normal for western Canada. Widespread heavy rain, together with snow in some areas, delayed seeding but re-established excellent soil-moisture levels in all areas except the northern half of Alberta. Cool weather following seeding delayed germination and subsequent crop development. Considerable flooding occurred in the southern parts of all three provinces in late June. Exceptionally hot weather during July speeded up crop development but ultimately produced near drought conditions with some resultant deterioration. Rains in late July and somewhat cooler temperatures in August were of marked benefit to the maturing crop. Harvesting of early-seeded rapeseed began in late July in the southern and some central regions of Manitoba and in early August in the Peace River area. Harvesting of grain crops was underway by mid-August in most parts of Alberta. A mid-August frost produced some damage to later-seeded crops in Alberta and Saskatchewan. Harvesting was markedly delayed by intermittent rains. Widespread sprouting occurred in swathed grains. As a result, large quantities of grain were dried in farm dryers.

Red Spring Wheat. The 1975 crop of Western Canadian wheat was estimated by Statistics Canada (at Sept. 15, 1975) at 486.5 million bushels (13.2 million metric tonnes), an increase of more than 19% over the 407.6 million bushel (11.1 million metric tonnes) crop in 1974. The carry-over of spring wheat from previous crops at July 31, 1975, was estimated about 264 million bushels (7.18 million metric tonnes), a substantial decrease from the 320 million bushel (8.7 million metric tonnes) carry-over one year earlier. The Canadian Grain Commission estimated that about 20% of the 1975 red spring wheat crop would qualify for No. 1 Canada Western Red Spring Wheat; 45% for the grade No. 2 Canada Western and 28% for the grade No. 3 Canada Western, with a further 7% entering the No. 3 Canada Utility grade.

The protein content of the 1975 crop of Western Canadian red spring wheat averaged 13.0%, well below the long-term average level of 13.6% for all red spring wheat crops during the 20-year period 1955-1974. Manitoba wheat averaged 13.5% protein, Saskatchewan wheat 13.0% and Alberta wheat 12.4%.

In view of the significantly lower than average level of protein content in the 1975 crop, it is unlikely that there will be any appreciable amount of No. 2 Canada Western 13.5% protein available from the Pacific seaboard; there may be very limited amounts of No. 1 Canada Western 13.5% protein. Some stocks of No. 1 and 2 Canada Western Wheat of 13.5% protein are expected to be available from Atlantic ports. There will be adequate stocks of these two grades at the 12.5% level from both Atlantic and Pacific ports. In addition, substantial amounts of these two grades at an 11.5% protein level will be available should the market demand it. Within each of the grades No. 1 and No. 2 C.W. increasing protein content in the segregates is accompanied by an increase in baking quality (higher loaf volume), baking absorption and better loaf appearance and crumb colour. Test weight and kernel weight levels decreased progressively with increasing protein but flour yield showed little change. Alpha-amylase activity tends to increase slightly with increasing protein content for the eastern prairie No. 2 C.W. wheat. Flour ash content and starch damage level decreased with increasing protein.

Eastern prairie red spring wheat grading No. 3 Canada Western gives a significantly higher loaf volume than the corresponding western prairie wheat of the No. 3 C.W. grade, reflecting its higher protein content. For this grade

eastern prairie wheat is lower in test weight and kernel weight and is considerably higher in alpha-amylase activity. The No. 3 C.W. eastern prairie wheat is about equal in baking quality to No. 2 C.W. eastern prairie wheat at a protein level of 12.5%. Western prairie wheat of the grade No. 3 C.W. is about equal in baking quality to No. 2 C.W. western prairie wheat at 11.5% protein. No. 3 C.W. wheat is, however, lower in test weight, poorer in flour yield and particularly for the eastern prairie, higher in alpha-amylase activity.

Eastern prairie new-crop wheat of the grades No. 1 and No. 2 Canada Western is higher in flour water absorption capacity than 1974-75 4th quarter Atlantic cargo exports. Baking quality is slightly lower this year (loaf volumes are lower) and the alpha-amylase activity is somewhat higher (i.e. poorer) in the new crop. Eastern prairie new-crop wheat of the grade No. 3 C.W. is fractionally lower in protein content but about equal in baking strength (loaf volume and baking absorption) to 4th quarter Atlantic shipments. Alpha-amylase activity of the No. 3 C.W. wheat is considerably higher in the new crop.

Western prairie new-crop wheat grading No. 1 and No. 2 is also lower in baking strength than 4th quarter 1974-75 Pacific exports. Flour yields are slightly higher for the No. 2 C.W. grades while flour colour for both No. 1 and No. 2 C.W. is slightly improved in the new crop. The alpha-amylase activity of both grades No. 1 and No. 2 C.W. is higher (poorer) than in the cargoes. Western prairie new-crop wheat grading No. 3 C.W. is considerably lower in protein content and gives a lower loaf volume than recent export shipments.

Amber Durum Wheat. The 1975 crop of Western Canadian amber durum wheat is estimated by Statistics Canada (at Sept. 15, 1975) at 91.5 million bushels (2.5 million metric tonnes). About 14% of the crop will qualify for the two grades No. 1 and No. 2 Canada Western, about 35% for No. 3 C.W. and 33% for No. 4 C.W. and 14% for No. 5 C.W., with about 2% entering each of the grades Extra No. 4 C.W. and No. 3 Canada Utility.

The protein content of the 1975 amber durum wheat crop averages 13.2% compared with 13.5% for the 1974 crop.

The milling and spaghetti making characteristics of the grades of the new crop durum wheat are satisfactory and spaghetti colour is good relative to the 1974 crop. Most of the grades of the new crop are equal or higher in hectolitre weight and thousand kernel weight. For most of the grades, the semolina is lower in pigment this year than last, but pigment levels in the spaghetti are adequate and spaghetti colour is satisfactory. Gluten strength is slightly higher this year for all grades except No. 4 and No. 5 C.W.

Barley. The 1975 crop of Western Canadian barley is estimated (Sept. 15, 1975) at 395 million bushels (8.6 million metric tonnes), an increase of 4.2% from the 379 million bushel crop in 1974. The adverse growing and harvest conditions were particularly damaging to the barley crop; only about 9% of the new-crop barley is expected to qualify for malting grades. The No. 1 Feed grade will predominate, accounting for an expected 64% of the crop. For the fourth successive year, only the early ripened grain was harvested under good conditions. Serious sprout damage occurred where barley lay in the swath for several weeks subjected to periodic rains. The overall malting quality of the 1975 barley crop is, however, much better than that of the previous crop.

Flaxseed. The 1975 crop of Western Canadian flaxseed is estimated at 17.1 million bushels (434.4 thousand metric tonnes), nearly 24% larger than the 13.8 million bushel 1974 crop. The poorer harvest weather down-graded considerable quantities of the 1975 crop and only 67% is expected to qualify

for the grade No. 1 C.W., with a further 25% entering No. 2 C.W. The oil content of the 1975 flaxseed crop averages 42.1%, fractionally lower than the 42.4% average figure for the 10 flaxseed crops from 1965 to 1974. The protein content of the oil-free flaxseed meal averages 42.6% this year, well above the 39.9% level of the 1974 crop. The iodine value of the oil averages 188 units this year.

Rapeseed. The 1975 crop of Western Canadian rapeseed is estimated at 71.6 million bushels (1.6 million metric tonnes), a very significant increase from the 50.4 million (1.14 million metric tonnes) bushel crop in 1974. Low erucic acid varieties of rapeseed were grown almost exclusively in 1975. The oil content of new crop rapeseed averages 41.3% (8.5% moisture basis, half a point higher than the level in the 1974 crop. The erucic acid content of the rapeseed oil averages 3.1% for the 1975 crop, a significant reduction from the 4.3% level in 1974. The protein content of the oil-free rapeseed meal averages 36.9% compared with 35.6% for the 1974 crop.

Eastern White Winter Wheat. Production of white winter wheat in south-western Ontario in 1975 is estimated to be 22.8 million bushels (620 thousand metric tonnes), a significant increase from the 19.1 million (.5 million tonnes) crop in 1974. The protein content of the 1975 crop averages 10.7%, markedly higher than the 9.0% level of the 1974 crop.

Eastern Canadian Soybeans. Soybean production in Eastern Canada in 1975 is estimated at 12.1 million bushels (329 thousand metric tonnes) a modest increase from the 11 million bushel (.29 million metric tonnes) crop in 1974. The oil content of the 1975 soybean crop averages 20.8% (moisture-free basis) compared with the level of 21.1% in the 1974 crop. The protein content of the oil-free soybean meal averages 52.5%, compared with 51.7% for the 1974 crop.

Eastern Corn. Seeding was carried out under favourable weather conditions. Growth and development was excellent, however, rain during late August and early September delayed the harvest. Ontario's estimated yield of 84 bushels per acre exceeded last year's yield by about 14 bushels and Quebec's estimated yield of 84 bushels per acre bettered the previous year's average by about 12 bushels per acre. Combined acreages for both provinces were about 1,527,000; 1,380,000 acres were seeded in Ontario, a 9.5% increase over last year, while 147,000 acres were seeded in Quebec, an 11% decrease from the 165,000 acres in 1974. Crop quality was generally good with the large majority of corn grading within the top three grades.

Meetings of Grain Standards Committees

The Western Grain Standards Committee met in Winnipeg on November 5 and 6, 1975. The main topics of discussion were the proposed changes to the grade schedules for rapeseed, flaxseed, peas, oats, and rye, and the lower than average quality of the 1975 crop as a result of inclement weather at harvest time. The Committee recommended the establishment of 37 samples as primary standards and 12 samples as export standards for the 1975-76 crop year. No. 1 Canada Utility and No. 3 Canada Utility wheat were included in the 12 samples recommended as export standards.

The Eastern Standards Committee held two meetings. At the September 4, 1975 meeting held in London, Ontario, the Committee recommended 12

samples as standard samples for the winter wheat, barley, rye and oats. The Committee discussed proposed changes to the grade schedules for rapeseed, flaxseed and rye, and also recommended changes to the grade schedules of Eastern White Winter Wheat and Grades of Beans (Canada Eastern). At the second meeting in Toronto, Ontario, on October 31, 1975, the Committee selected and recommended 11 samples as standard samples of corn, soybeans and pea beans. The Committee was advised that the Commission was taking action on their recommended changes to the Eastern White Winter Wheat and Grades of Beans (Canada Eastern) schedules.

Committee membership as constituted in Section 17 of the Canada Grain Act is listed in Appendix B of this report.

Variety Testing

Three thousand samples of wheat and barley varieties were received by the Inspection Division from Canadian plant breeders for examination and report on visual kernel characteristics. Thirty-four varieties of wheat and 63 varieties of spring and winter barley grown in 1975 Eastern and Western co-operative variety tests were submitted to the Division.

The Grain Research Laboratory conducted detailed studies of the quality of plant breeder's cultivars of red spring and amber durum wheats and malt-ing barleys grown in the annual co-operative test sponsored by the Canada Committee on Grain Quality. In 1975, tests were carried out on 31 cultivars of red spring wheat, 34 cultivars of amber wheat, and 25 cultivars of barley. This material represented the 1974 crop of plant breeders varieties which were tested early in 1975.

The Research Laboratory participated in the annual wheat quality evaluation program sponsored by the Crop Quality Council of the United States. In 1975, the Laboratory along with 17 American collaborators evaluated the milling and baking quality of 25 samples representing seven wheat cultivars developed for the spring wheat area of the upper mid-west United States.

SECTION 2—DOCUMENTATION AND ELEVATOR OPERATIONS

Grain Documentation

Documentation Services. The Economics and Statistics Division provides a documentation and reporting service for inward and outward grain movement at licensed terminal elevators in the Western Division. Basic information is extracted from reports of the Inspection and Weighing Divisions to provide the input to the Division's data processing facilities for production of documents such as Certificates of Canadian Grain, Terminal Elevator Receipts and Terminal Elevator Outturns. These documents are produced in Winnipeg or Vancouver for distribution within the grain industry. A telecommunications network enables information to be distributed to the grain-handling companies, the railways and the Canadian Wheat Board. This information becomes direct input to the internal accounting systems of these organizations as well as providing the basis for calculating payments for grains, storage and freight. It is also the source of much of the statistical information which the Division publishes.

Statistics. Licensees are required to submit prescribed records and periodic reports of stocks and handlings of grain as a basis for the Commission's control and supervision of the elevator system. The Economics and Statistics Division also receives corresponding data from other divisions of the Commission, from the Canadian Wheat Board, and from other organizations and associations within the grain trade. From this information the division compiles and publishes comprehensive bulletins relating to the storage and movement of Canadian grain within the Canadian elevator system and to domestic and export markets. Throughout the year these reports were distributed to Canadian and overseas correspondents and also served as a basis for supervisory and regulatory assessments within the Commission, the Canadian Wheat Board and related agencies.

As the principal source of Canadian grain storage and handling statistics, the Division worked closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, the Canada Grains Council, and other federal and provincial government offices. On a correspondent basis, it exchanged data and provided statistical assistance internationally with the Commonwealth Economic Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the United States Department of Agriculture.

Summary statistics pertaining to the 1974-75 crop year appear in the tables forming part of Appendix A and a list of the principal statistical releases is included in Appendix C.

Licensing and Bonding. As at August 1, 1975 the Commission issued a total of 4,258 licenses for all elevator categories compared with 4,379 a year earlier, plus 37 grain dealer licenses compared to 27 the year previous. Total licensed storage capacity decreased to 638,054,410 bushels from 647,652,710 bushels. A reduction of 6.8 million occurred in the primary elevator system, while terminal elevator capacity dropped 2.0 millions. The process elevator capacity reflected an increase of 1.8 millions while transfer storage dropped 2.6 millions from a year ago.

Guarantee bonds executed by 19 surety companies were deposited with the Commission as security by the licensees during the crop year 1974-75.

Terminal, transfer and primary elevator licensees were required to maintain adequate insurance on grain stocks in their licensed premises. The insurance policies supporting this coverage were filed with the Economics and Statistics Division, which in turn verified the adequacy of this coverage by comparison with regular stock reports submitted by licensees.

Registration. Operators of terminal and transfer elevators are required to issue terminal or transfer elevator receipts, for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration, become negotiable documents to be used as collateral by the grain companies in financing the movement of grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver and Montreal, the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipment.

Primary Elevators

Inspection of Elevators. The Commission has Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Calgary, to keep the Commission in close touch with the operations of licensed primary elevators in the Prairie Provinces.

During 1975, the Assistant Commissioners inspected 505 elevators in Manitoba, 777 in Saskatchewan and 340 in Alberta, a total of 1,622. This inspection included checks on scales, sieves, moisture meters and certain other equipment; deductions for shrinkage, use of authorized forms, and posting of current Commission regulations applying to primary elevators.

In the Eastern Division, the Assistant Commissioner is located at Harrow, Ontario.

In addition to their regular program of inspections, the Assistant Commissioners assisted in the investigation of producers' complaints and of reported infractions of the Commission's regulations and orders. They also received and handled numerous inquiries from producers and elevator operators on various matters such as grain grading and movement; participated in special investigations, surveys and projects; and publicized the work of the Commission through contact with both the farm and business community.

Weigh-overs. The results of the 1974-75 primary elevator weigh-over program conducted by licensed grain companies are summarized in the following table.

The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners are given authority to deal directly with elevator managers and superintendents where excessive overages or shortages have been reported.

Elevators reporting	1974-75	1973-74
Shortages	319	288
Neither overages nor shortages . .	50	27
Overages of less than .25%	509	267
Overages of .25% to .50%	256	360
Overages over .50%	115	485
Total number of elevators weighed over	1,249	1,427

Tariff of Charges. A revised maximum tariff for primary elevators went into effect on August 1, 1975. The maximum rate for elevation for all kinds of grain was increased from 10½¢ to 12¢ per bushel, and a maximum rate of 5¢ per bushel was established for cleaning grain to remove dockage. The maximum charge for custom drying was set at 12¢ per bushel.

Terminal, Process and Transfer Elevators

Services. The staff of the Inspection Division sampled and graded all grain received at and shipped from licensed terminal elevators in the Western Division. The grain at those elevators was weighed under the supervision of the Commission's Weighing Division staff. Similar services were also provided at some licensed process elevators in the Western Division.

Grain loaded into vessels for export at licensed transfer elevators located at St. Lawrence River and Maritime ports was sampled, inspected and certified. Other sampling, inspection and weighing services in the Eastern Division were provided only on request. The Chatham, Ontario, inspection unit sampled and graded a considerable volume of eastern-grown grain for the area's grain trade. Appendix A provides information on the quantity of grain inspected and weighed during the 1974-75 crop year.

Grain Drying. During the 1974-75 crop year, about 91.5 million bushels of high-moisture grain were artificially dried at terminal elevators under supervision of the Commission's Inspection Division, a considerable increase over the 63 million bushel quantity processed during the previous year.

Weigh-overs. Audits are periodically conducted by the Commission's Weighing and Inspection Divisions to enable the Commission to determine whether grain-handling operations at elevators have resulted in any excessive overages or shortages in the various types and grades of grain, and to establish the validity of commercial documents covering stored grain. Summaries of the results of each weigh-over are prepared by the Economics and Statistics Division for review by the Commission.

During the 1974-75 crop year, 11 terminal and 7 transfer elevators were subject to such audits.

Inspection of Equipment. Officials of the Commission's Weighing Division carried out 491 inspections on 416 scales in licensed terminal and transfer elevators. These inspections include those of a routine scheduled nature

and also those carried out as a result of any doubt as to continued accuracy of scales in any terminal or transfer elevator.

Plans and specifications for new elevator facilities and alterations to elevators and existing grain-handling equipment were examined before authority was granted for commencement of work by elevator managers. A total of 30 such projects were reviewed, including installation of dust control systems and automatic scales. When completed, new facilities and installations were inspected by officials of the Commission.

New Equipment. Twenty-one manually operated mechanical scales in three terminal or transfer elevators were replaced by automated electronic scales and control systems. The new scale equipment, as well as that installed in previous years, was subject to thorough testing by scale technicians on the staff of the Commission's Grain Weighing Division.

On June 1, 1975 the Automated Digital Analyzer purchased in 1974 was placed on-line in Winnipeg, replacing the work done by the Winnipeg, Calgary and Thunder Bay Kjeldahl laboratories of the Inspection Division.

A further 10 grain quality analyzers were purchased during 1975 in order to carry out full-scale simulation studies of the use of these instruments in terminal elevator environments.

Pneumatic sample transport systems were installed at a number of terminal elevators to facilitate the on-site protein evaluation of red spring wheat and to provide rapid transit of samples from shipping sampling stations.

Tariff of Charges. The maximum tariff for licensed terminal elevators was amended, effective August 1, 1975 to permit increased charges for elevation and various other services. The revised elevation rates are 5½¢ per bushel for wheat, oats and barley; 5⅞¢ for rye; 6⅞¢ for flaxseed; 7⅞¢ for rapeseed and mustard seed. The maximum rate for cleaning is 5¢ per bushel for all grains, and for drying is 12¢ per bushel for all grains.

The maximum tariff for licensed transfer elevators in the Eastern Division was replaced by a revised tariff which contains combined maximum elevation rates for receiving and shipping. These rates range from \$51.00 to \$65.00 per 1,000 bushels, depending on whether the grain is shipped by vessel, railway car or truck. The rate for storing grain remains at 1/20¢ per bushel per day, but increased rates of \$75.00, \$100.00 and \$250.00 per 1,000 bushels, respectively, have been established for drying damp, moist and wet grain. This revision became effective April 1, 1975.

Canadian Government Elevators

The Canadian Grain Commission manages and operates five inland terminals and one seaboard terminal.

Handlings. Total receipts of grain during the 1974-75 crop year were 53 million bushels. This was an increase of 3.2 million bushels over the previous record handlings of 49.8 million bushels attained during the 1973-74 crop year and a substantial increase over the historical average of approximately 20 million bushels. Total shipments of grain were 54 million bushels. Approximately two thirds of the grain received was wheat, with the balance consisting of oats, barley, rapeseed, flaxseed, mustard seed, and corn. Receipts and shipments at the individual elevators were as follows:

Elevator	Capacity	Stocks August 1	Receipts	Shipments	Stocks July 31,
		1974			1975
— thousands of bushels —					
Moose Jaw	5,500	2,018	7,673	7,109	2,582
Saskatoon	5,500	4,132	9,001	9,015	4,118
Calgary	2,500	1,950	5,391	6,268	1,073
Edmonton	2,350	1,659	5,269	5,589	1,339
Lethbridge	1,250	754	4,834	5,453	135
Prince Rupert	2,250	824	20,878	20,585	1,117
Totals	19,350	11,337	53,046	54,019	10,364

Commercial Trucking. During the course of the year, all interior terminals were engaged in a commercial trucking movement where wheat and barley were received. A total of 17,442 commercial trucks delivered 15.2 million net bushels which was subsequently shipped to Vancouver, Prince Rupert, Thunder Bay and Churchill, as required by the Canadian Wheat Board to meet their export sales commitments.

Equipment. The electrical and mechanical equipment rehabilitation program at the Calgary elevator progressed well and it is expected that this project will be completed early in 1976. A new grain dryer with an approximate capacity of 2,000 bushels per hour was installed at Prince Rupert, and arrangements proceeded for installation of a boxcar dumper and equipment to control air pollution by grain dust, with completion scheduled for 1976 also.

These projects have been undertaken to improve operating efficiency, and in some cases, to ensure compliance with safety and anti-pollution requirements.

Complaints and Inquiries

Producers' Complaints. During 1975, the Commission and the Assistant Commissioners investigated 24 written complaints about producer transactions with operators of licensed primary elevators. In most of the disputes it was possible to arrange satisfactory settlements between the parties concerned.

In addition, the Assistant Commissioners dealt with a variety of informal complaints and, when necessary, advised elevator managers and local superintendents on correct procedures.

Cargo Shortages. When excessive shortages were indicated in the weights of vessel shipments of grain from Canadian lake and seaboard ports, officials of the Weighing Division investigated the loading of the cargoes and reviewed all available information relating to the unloading of the grain at destination. There was no evidence that the reported shortages resulted from defective scales or faulty weighing practices at licensed Canadian elevators.

Quality of Export Shipments. When inquiries were received relating to any quality characteristics of grain shipped to overseas destinations, thorough investigations were carried out by the Inspection Division or the Research Laboratory. Official samples taken from the shipments at the time of loading were studied and subjected to special tests, and detailed reports of the investigations were provided to interested parties.

SECTION 3—RESEARCH, INFORMATION AND OTHER SERVICES

Research

Laboratory Research. The maintenance of an active program of basic and applied research focusing in part on the composition and properties and the interactions of the constituent compounds of bread wheats, durum wheats, malting and feed barleys and oilseeds is a major continuing responsibility of the Grain Research Laboratory. The research contributes to an ever-broadening body of knowledge of cereal grains and oilseeds.

The study of enzyme systems in cereal grains continues a major area of Laboratory research. A rapid and simple technique has been developed for the isolation of wheat alpha-amylase by affinity chromatography. A fully automated and highly sensitive method has been developed to determine the levels of alpha-amylase in cereal products. The distribution and levels of proteolytic enzymes have been followed during the development of the red spring wheat variety, Neepawa, in order to ascertain their potential effect upon gluten protein structure. Two proteolytic enzymes were purified to electrophoretic homogeneity from extracts of a sample of germinated Manitou red spring wheat. As well, eight Canadian wheat cultivars were analyzed for the levels of amino-peptidase present during growth and maturation.

Further research was conducted on the phenomenon of unmixing observed in studies of the mechanical development of dough. When a rest period (e.g. 2-16 min.) was introduced between an initial short premix and continuation of dough mixing to optimum development, consistency level (torque) was markedly higher when the mixer was restarted, then dropped somewhat before increasing to peak level. Baking studies confirmed that a rest period exaggerates the "unmixing effect" which may take place even when a developed dough is subsequently remixed for a very short time at high speed.

A research energy input meter has been designed and built for use with laboratory dough mixers where a number of variable factors have to be applied to obtain energy measurements. A survey is currently being carried out to examine the variations in mechanical efficiency that may exist between and within different designs of mixers. Work has been completed on standardization of the 6-inch and 10-inch diameter Grain Research Laboratory research roll stands.

Research on durum wheat has included mixing studies, studies on spaghetti-making quality of durum wheats at various stages of maturity and studies of the factors affecting the cooking quality. As well, changes in the physical and chemical properties of semolina during spaghetti making were explored.

The specific gravity and porosity of barley and malt were examined. Several reagents were investigated to determine whether the reagents would be useful for identifying different barley cultivars. Forty-five samples of kilned malt were analyzed for free sugar composition and a total of 317 barley samples were received from three feed barley breeding programs for determination of lysine. An investigation was also conducted on the digestibility of barley fed to chicks. Results suggest that high temperatures during the extrusion process may affect the digestibility of barley starch. The physical properties of the alpha-amylase isoenzyme, the minor component in the alpha-

amylase complex of germinated barley, were determined and its hydrolytic action on amylose and starch are being studied in detail.

Rapeseed was examined for its density, hectolitre weight, porosity, kernel weight, protein, oil, moisture, erucic acid content and iodine value, and interrelationships were established between these properties. A technique was developed for the determination of chlorophyll in rapeseed using reflectance spectroscopy. Units were established for the chlorophyll content of the seed so that the crude oil will not exceed the Canadian Government Standards Board specifications for oil colour. Chlorophyll content has also been related to the present grading specifications for rapeseed as laid down in the Canada Grain Act.

Methods have been devised and adapted to permit confirmation in carlot and cargo samples of residues of organochlorine pesticides. A method has also been devised for analysis of suspect seed grain for residues of some of the commonly used seed-treatment pesticides. The method permits analysis of stained kernels of wheat, barley, oats and rye found in commercial shipments.

Extensive reviews of the published literature on the value of feed grains, pulses and oilseed meals were continued and a series of comprehensive summaries were compiled on Grain Legumes for Feed, Oilseed Meals for Feed, U.S. Research in Grain, Legumes and Oilseeds for Animal Feed. Another report entitled "Canadian Utility Wheats, Results of Feeding Trials 1973-74", was edited in the Research Laboratory and Published by the Canadian Wheat Board.

Statistical and Economic Studies. The program of studies of grain-handling costs was continued by the Economics and Statistics Division during the year. The costs of services within terminals operated by the Canadian Government Elevators Division of the Commission were analyzed in detail. A special review of Eastern Transfer Elevator handling and storage tariffs were also undertaken. Terminal elevator handling and storage revenues were considered with particular emphasis on the costs of cleaning grain within the elevator system. Reports in all these areas were provided to Commission members to keep them informed of the adequacy of present levels of handling and storage tariffs within the industry.

A number of statistical research projects related to the segregation of wheat by protein content at terminal elevators with a view to development of procedures to utilize new protein-testing technology. A computer evaluation of the simulated use of infra-red spectroscopy devices for the segregation of wheat at terminal elevators was developed by the Division.

The Economics and Statistics Division prepared a number of special statistical tabulations of physical and handling characteristics of the primary elevator system for use by various groups studying the grain-handling industry.

An inter-divisional committee of the Commission reviewed the convention of shrinkage allowances in the grain industry and reported to the Commission in this regard.

Information Program

Publications. The Commission issued and distributed a revised edition of the booklet entitled "Grain Grading Handbook for Western Canada" and also

a new booklet "Grain Grading Handbook for Eastern Canada". These publications contain detailed information in regard to the specifications for all official Canadian grain grades, tolerances of grading factors and other related subjects.

The Economics and Statistics Division regularly published and distributed statistics on the movement and storage of grain within the licensed elevator system.

The Research Laboratory issued and distributed the 1975 wheat protein map and crop bulletins on the Western Canada crops of red spring wheat, amber durum wheat, barley, flaxseed and rapeseed. Information on the 1975 crops of Eastern White Winter Wheat and Eastern Soybeans was distributed to the trade. Regular quarterly bulletins on the quality of export shipments of red spring and amber durum wheat were also published by the Research Laboratory. A separate report of the Laboratory's activities is also published.

Members of the staff of the Grain Research Laboratory published a total of 8 scientific and technical papers, that appeared in 4 scientific journals.

Meetings. Commissioners and senior officials addressed a number of annual meetings of producer organizations to discuss Commission activities. They also attended a number of other meetings of organizations interested in the storage, transportation and marketing of grain.

In addition, regular annual meetings of the Western and Eastern Grain Standards Committees were convened by the Commission.

Professional and technical staff of the Grain Research Laboratory represented the Commission at sixteen scientific and technical conferences, four of which were overseas.

Overseas Visits. Officials and experts of the Commission visited Europe, Great Britain, Japan, Hong Kong, Korea, China, Iran, Venezuela, Brazil, Trinidad and India, to meet with government personnel, research staff, millers and processors. Detailed information on Canadian grain and oilseeds, particularly the 1975 crop, was provided. Matters such as grain inspection and certification, research, marketing, transportation and storage were also discussed.

Tours of Commission Facilities. Missions from U.S.S.R., India, Japan and Saudi Arabia, as well as officials from the Philippines, Norway, Japan, Sweden, Finland, Iran, India, Poland, Australia and the United States toured Commission facilities during the year.

Tours and lecture sessions were arranged also for participants of the Canadian International Grains Institute courses, grain producers, groups of elevator managers, grain company employees and agricultural students.

Other Services

Pesticide Residue Monitoring. During 1975, 1,637 cargoes of red spring wheat, amber durum wheat and barley were checked for organochlorine and thiophosphate residues by the Research Laboratory to ensure conformance with tolerances applying in various market areas. As well, a monitoring program for the presence of mercury-containing seed treatment chemicals in grains was maintained by the Commission.

Erucic Acid Monitoring of Rapeseed. The Research Laboratory checked the erucic acid content of 4601 carlots of rapeseed during 1975. Some 364 cargoes of rapeseed exported from Canada were analyzed for erucic acid content. Cargo samples were checked for oil content and protein content of the oil-free meal. The oil content of rapeseed cargoes was provided to the industry on a monthly basis.

Protein Segregation of Wheat. Segregation of red spring wheat by protein content was effectively maintained during the year at the terminal elevators.

Since June 2, 1975, infra-red spectroscopy is being used to determine the protein content of country carlot shipments. Standardization and monitoring of the method is basis the internationally applied Kjeldahl method. The equipment, known as the Analytical Digital Analyzer (A.D.A.) has replaced the Inspection Division's Kjeldahl laboratories at Calgary, Thunder Bay and Winnipeg.

Cargoes of both segregated levels consistently satisfied export protein requirements. No formal complaints over guaranteed protein levels were received from Canada's customers.

The Commission's research and testing program of equipment capable of providing consistent and dependable protein determination for wheat was extended into terminals at Vancouver. Two types of single-celled protein determination devices, utilizing the principle of infra-red spectroscopy, received further testing under operational conditions. Further research and testing will be completed and evaluated before the Commission decides on the adoption of this system at terminal elevators.

Entomology Services. Much of the 1974 grain crop in western Canada was harvested with a high-moisture content and with an above-normal degree of immaturity.

These conditions made the grain much more susceptible to infestation and led to an increase in the volume of infested grain arriving at terminal elevators. During the 1974-75 crop year a total of 131 carlots were treated for infestation at the Vancouver and Thunder Bay terminals.

Some 35,000 samples were checked by the Vancouver, Thunder Bay and southern Ontario laboratories. Twenty-six species of insects were intercepted, but only four of these were common to all districts: the Rusty grain beetle (*Cryptolestes ferrugineus*), the Yellow Mealworm (*Tenebrio molitor* L.), Fungus beetle of various kinds, and Black carpet beetles (*Attagenus piceus* [Oliv.]). Only the Rusty grain beetle is of economic importance as an indicator of tough or out-of-condition grain.

The sampling at the terminals was expanded to include ship loading to prevent infested grain from being loaded on foreign vessels or lakere. Unloading boxcars were randomly sampled to provide information on country elevator conditions.

A total of 9,000 cut-off samples were processed in the Winnipeg laboratory originating from 547 country points across the prairies. Treatment was requested for 162 storage bins. Since the infestation problems originate from prairie points, an educational program for travelling supervisors of various country elevator companies was initiated.

An experiment, conducted by the Research Branch of Agriculture Canada, in the Canadian Government Elevator at Moose Jaw, confirmed the usefulness of cooling grain to about -7°C (20°F.) to control insect infestation.

Monitoring Moisture Meter Performance. A bi-weekly program of check tests to monitor the performance of the 134 3-inch cell and the 31 3½ inch cell, Model 919 Moisture Meters, used by the Inspection Division across Canada, was maintained by the Research Laboratory. During the year, moisture-testing facilities at Vancouver, Victoria, Prince Rupert, Calgary, Lethbridge, Edmonton, Moose Jaw, Saskatoon, Thunder Bay, Montreal, Three Rivers, Sorel and Quebec were inspected at their respective sites. The laboratory also prepared and distributed the Eastern Corn Chart #4.

Grain Appeal Tribunal. During the crop year 1974-75 a total of 601 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of carlots officially inspected in the Western Division. The grades assigned by the Grain Inspection Division were sustained in 520 cases. Most of the samples reviewed by the Tribunal represented shipments of either wheat or barley and covered a wide range of varieties and grades.

Grading Services to Producers. The total number of "Subject to Grade and Dockage" and other unofficial samples inspected for producers and the trade was 67,193 compared with 38,644 during the previous crop year. The Chief Grain Inspector dealt with 19 complaints from producers relating to special bin carlot shipments. His comparisons of primary delivery samples with official unload samples established that in five cases the identity of the producer's grain had not been preserved in handling through the primary elevator.

Special Acts Administration. Subsequent to the appointment of a supervisor of grain futures trading under provisions of the Grain Futures Act, the Commission undertook the preparation of regulations to be used in administering the Act.

The Commission did not find it necessary to establish any maximum freight rates under the provisions of the Inland Water Freight Rates Act.

SECTION 4—PERSONNEL ADMINISTRATION

Personnel services relating to Canadian Grain Commission staff were provided by the Personnel Administration Branch of Agriculture Canada.

Mr. F. M. Hetland resigned from his position as a member of the Commission at the end of 1975, at which time he was appointed to the Canadian Wheat Board.

Mr. J. B. Hooker, Assistant Commissioner at Saskatoon, retired during 1975.

Mr. G. Marshall was appointed to the position of Assistant Commissioner at Calgary.

Mr. W. R. Folliott was appointed to the position of Supervisor over the Winnipeg Commodity Exchange, under the authority of the Grain Futures Act.

At December 31, 1975, total staff exclusive of the Canadian Government Elevators was 877 compared with 890 at the end of 1974. The staff of the Canadian Government Elevators totalled 190, a decrease of 112 since December 31, 1974.

APPENDIX A

Grain Statistics and Quality

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A-1 — Supply and Disposition of Canadian Grains, Crop Year 1974-75 *

	Wheat**	Oats	Barley	Rye	Flaxseed	Rapeseed	Totals
— thousands of bushels —							
SUPPLY							
Carry-over July 31, 1974***	370,704	77,379	208,410	10,510	7,911	12,386	687,300
Production in 1974	488,513	254,745	404,286	18,914	13,800	51,300	1,231,558
Imports	—	1,940	—	—	16	—	1,956
Total Supply	859,217	334,064	612,696	29,424	21,727	63,686	1,920,814
DISPOSITION							
Exports***	394,594	1,415	138,393	4,843	10,519	26,145	575,909
Domestic Use	169,294	259,247	285,794	11,216	2,603	19,908	748,062
Total Disposition	563,888	260,662	424,187	16,059	13,122	46,053	1,323,971
CARRY-OVER (July 31, 1975)							
On Farms (estimated)	60,000	48,000	51,000	3,500	2,500	4,000	169,000
In primary, process and terminal elevators	143,945	22,190	101,288	7,942	5,486	12,277	293,128
In store and afloat to eastern transfer elevators	60,114	1,601	18,342	1,373	50	—	81,480
In eastern and western mill bins	5,695	166	1	1	—	—	5,863
In transit by rail, eastern and western divisions . . .	25,575	1,445	17,878	549	569	1,356	47,372
In store and in transit to the United States	—	—	—	—	—	—	—
Total in store July 31, 1975	295,329	73,402	188,509	13,365	8,605	17,633	596,843

* Subject to revision.

** Wheat includes Durum Wheat.

*** Revised.

**** Includes exports of bulk grain, seed and (except for flaxseed and rapeseed) milled and process products expressed as grain equivalents.

A-2 — Licences in Force and Storage Capacity, August 1, 1975 and 1974

Type of Licence	Licences in force		Licensed storage capacity	
	August 1 1975	1974	August 1 1975	1974
Primary Elevator	4,165	4,292	355,467,650	362,272,700
Terminal and Process Elevator	66	59	160,257,460	160,388,710
Transfer Elevator	27	28	122,329,300	124,991,300
Grain Dealer	37	27	*	*
Totals	4,295	4,406	638,054,410	647,652,710

* These licences do not cover grain storage facilities.

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1974-75

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Canada Western Red Spring	58,042	31.3	—
Tough 1 Canada Western Red Spring	1,775	1.0	—
2 Canada Western Red Spring	29,868	16.1	—
Tough 2 Canada Western Red Spring	10,508	5.7	—
3 Canada Western Red Spring	26,928	14.5	—
Tough 3 Canada Western Red Spring	19,527	10.5	—
1 Canada Utility	1,814	1.0	—
2 Canada Utility	559	.3	—
3 Canada Utility	16,944	9.1	—
Tough Others	18,541	10.0	—
Damp	954	.5	—
Rejected	54	*	—
Others red spring	—	*	—
Total red spring wheat	185,514	100.0	86.3
1 Canada Western Amber Durum	1,527	5.6	—
2 Canada Western Amber Durum	4,902	18.1	—
3 Canada Western Amber Durum	5,158	19.0	—
Extra 4 Canada Western Amber Durum	3,157	11.6	—
4 Canada Western Amber Durum	6,248	23.1	—
5 Canada Western Amber Durum	3,961	14.6	—
Tough durum	2,022	7.5	—
Others durum	141	.5	—
Total amber durum wheat	27,116	100.0	12.7
Total soft white spring	1,229	—	.5
Total mixed wheat	—	—	*
Total Alberta winter wheat	1,228	—	.5
Total all wheats	215,087	100.0	100.0

* Less than 0.05%

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1974-75 (Continued)

Grade	Carlots	Percentage
OATS		
1 Canada Western	3	*
2 Canada Western	4	*
Extra 3 Canada Western	22	.2
3 Canada Western	1,850	19.0
Extra 1 Feed	689	7.1
1 Feed	4,859	49.8
2 Feed	587	6.0
3 Feed	180	1.9
Mixed Feed	1	*
Tough	1,450	14.9
Damp	7	.1
Rejected	49	.5
Others	49	.5
Total oats	9,750	100.0
BARLEY		
1 Canada Western Six-Row	13	*
2 Canada Western Six-Row	4,930	5.8
1 Canada Western Two-Row	34	*
2 Canada Western Two-Row	2,906	3.4
1 Feed	46,962	55.5
2 Feed	10,937	12.9
3 Feed	1,604	1.9
Tough	16,652	19.8
Damp	323	.4
Rejected	173	.2
Others	101	.1
Total barley	84,635	100.0

* Less than 0.05%

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1974-75 (Continued)

Grade	Carlots	Percentage
RYE		
1 Canada Western	24	.9
2 Canada Western	1,975	70.7
3 Canada Western	463	16.5
4 Canada Western	75	2.7
Ergoty	2	.1
Tough	249	8.9
Damp	2	.1
Rejected	—	—
Others	4	.1
Total rye	2,794	100.0
FLAXSEED		
1 Canada Western	4,788	83.1
2 Canada Western	358	6.2
3 Canada Western	93	1.6
4 Canada Western	9	.1
Tough	493	8.6
Damp	6	.1
Rejected	4	.1
Others	13	.2
Total flaxseed	5,764	100.0
RAPESEED		
1 Canada	12,570	91.8
2 Canada	668	4.9
3 Canada	202	1.5
Others	255	1.8
Total rapeseed	13,695	100.0

* Less than 0.05%

A-3 — Inward Carlot Inspections of Western Grain, Crop Year 1974-75 (Concluded)

Grade	Carlots	Percentage
OTHER GRAINS		
Corn	6	.1
Sunflower seed	167	10.0
Mixed grain	105	6.3
Screenings	345	20.6
Buckwheat	190	11.3
Soybeans	—	—
Peas	70	4.2
Sample grain	—	—
Safflower seed	2	—
Mustard seed	784	46.8
Condemned grain	11	.7
	1,680	100.0
Grand Total	333,405	—

A-4 — Samples of Western Grain “Subject to Grade and Dockage” and Unofficial Samples Inspected, Crop Year 1974-75 Compared with Crop Year 1973-74

Point	1974-75	1973-74
	Number of Samples	
Winnipeg	34,107	19,765
Calgary	17,592	8,310
Edmonton	1,049	337
Moose Jaw	544	168
Saskatoon	2,811	1,523
Lethbridge	9,024	8,541
Vancouver	2,066	—
Totals	67,193	38,644

A-5 — Inward Carlot and Trucklot Re-inspections of Western Grain, Crop Year 1974-75

Point	Inspected	Re- Inspected	Un- changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay.	208,920	15,175	13,980	1,075	62	10	48
Winnipeg	5,742	1,561	1,416	120	10	4	11
Churchill.	10,404	443	359	80	2	2	—
Moose Jaw	6,506	385	308	71	1	—	5
Saskatoon	10,454	526	448	71	1	—	6
Calgary	6,906	870	827	39	3	—	1
Edmonton	4,817	464	428	33	1	—	2
Lethbridge.	5,854	531	502	29	—	—	—
Prince Rupert	9,722	515	496	16	—	1	2
Vancouver.	89,169	6,590	6,005	541	12	7	25
Totals	358,494	27,060	24,769	2,075	92	24	100
Percentage of total carlots and trucklots	100.0	7.6	6.9	.6	*	*	*

* Less than 0.05%

A-6 — Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1974-75

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	108	5,422	73	744	2,129
Oats	146	3,064	16	17	-
Barley	258	6,191	1,002	865	450
Flaxseed	-	802	7	7	37
Rye	-	77	35	-	-
Mixed Grain	19	21	11	-	-
Corn	-	-	-	-	-
Buckwheat	-	1	-	-	-
Peas	76	9	-	-	-
Screenings	141	3,131	30	95	43
Rapeseed	-	583	141	147	3
Sample feed grain	31	-	3	-	-
Mustard seed	-	22	24	-	37
Sample grain	-	78	-	-	-
Sunflower	-	3	-	-	-
Canary seed	-	-	-	-	4
Totals	779	19,404	1,342	1,875	2,703

Grain	Saskatoon	Lethbridge	Vancouver, Victoria and Prince Rupert	Churchill
Wheat	1,060	1,512	493	-
Oats	116	9	430	-
Barley	1,042	2	604	-
Flaxseed	19	7	2	-
Rye	-	1	1	-
Mixed grain	8	7	-	-
Corn	-	-	1	-
Buckwheat	-	-	1	-
Peas	-	-	-	-
Screenings	318	34	652	-
Rapeseed	776	-	57	-
Sample feed grain	-	-	-	-
Mustard seed	89	14	1	-
Sample grain	-	-	2	-
Canary seed	6	-	-	-
Sunflower	-	-	-	-
Totals	3,434	1,586	2,244	-

A-7 — Carlot Inspections of Eastern Grain, Crop Year 1974-75

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
1 Canada Eastern White Winter	—	—	75	75
2 Canada Eastern White Winter	—	—	575	575
3 Canada Eastern White Winter	—	—	40	40
4 Canada Eastern White Winter	—	—	10	10
5 Canada Eastern White Winter	—	—	4	4
2 Canada Eastern Mixed Winter	—	—	9	9
3 Canada Eastern Mixed Winter	—	—	2	2
Tough	—	—	79	79
Totals	—	—	794	794
CORN				
Extra Dry 1 Canada Eastern Yellow	—	—	15	15
1 Canada Eastern Yellow	—	—	7	7
Extra Dry 2 Canada Eastern Yellow	—	—	56	56
2 Canada Eastern Yellow	—	—	36	36
Extra Dry 3 Canada Eastern Yellow	—	—	98	98
3 Canada Eastern Yellow	4	—	161	165
Extra Dry 4 Canada Eastern Yellow	1	—	49	50
4 Canada Eastern Yellow	2	—	62	64
Extra Dry 5 Canada Eastern Yellow	—	—	6	6
5 Canada Eastern Yellow	—	—	8	8
Tough	—	—	16	16
Sample	—	—	2	2
Totals	7	—	516	523
BEANS				
Extra 1 Canada Eastern Pea	—	—	3	3
1 Canada Eastern Pea	—	—	17	17
2 Canada Eastern Pea	1	—	1	2
1 Canada Eastern Light Red Kidney	—	—	16	16
Totals	1	—	37	38

**A-7 — Carlot Inspections of Eastern Grain, Crop Year 1974-75
(Continued)**

Grade	Montreal	Toronto	Chatham	Total
SOYBEANS				
1 Canada Yellow	—	—	134	134
2 Canada Yellow	—	—	207	207
3 Canada Yellow	—	—	11	11
4 Canada Yellow	—	—	1	1
5 Canada Yellow	—	—	1	1
Tough	—	—	12	12
Moist.	—	—	1	1
Sample	—	—	2	2
Totals	—	—	369	369
Totals, all grains	8	—	1,716	1,724

**A-8 — Inspections of Eastern Grain in Cargoes, Bins, Trucks or
Warehouses, Crop Year 1974-75**

Grain	Montreal	Toronto	Chatham	Total
— bushels —				
Wheat	876,326	—	10,862,047	11,738,373
Barley	—	1,370	—	1,370
Beans	—	—	1,735,140	1,735,140
Peas	—	—	3,518	3,518
Soybeans	—	—	217,246	217,246
Totals	876,326	1,370	12,817,951	13,695,647

A-9 — Inward and Export Cargoes Sampled and Inspected, Crop Year 1974-75

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Baie Comeau	Port Cartier	Total
				— bushels —				
Eastern grain								
Inward	1,589,922	—	—	—	—	—	—	1,589,922
Export	7,068,119	—	—	—	2,576,373	1,176,404	—	10,820,896
Western grain								
Inward	5,108,255	—	—	—	—	—	—	5,108,255
Export	48,760,558	17,206,297	17,675,107	33,642,924	29,468,290	39,691,086	67,360,022	253,804,284
Totals	62,526,854	17,206,297	17,675,107	33,642,924	29,468,290	42,267,459	68,536,426	271,323,357

A-10 — Grain Sampled but not Inspected, Crop Year 1974-75

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern grain							
Carlots	8	-	-	-	-	-	8
Inward cargoes (bu.)	1,887,461	-	-	-	-	-	1,887,461
Outward cargoes (bu.)	-	-	-	-	-	-	-
Bin lots (bu.)	1,116,403	-	-	-	-	-	1,116,403
Western grain							
Carlots	20	-	1	-	-	-	21
Inward cargoes (bu.)	4,161,193	-	93,770	-	-	-	4,254,963
Outward cargoes (bu.)	-	-	1,342,386	-	-	-	1,342,386
Bin lots (bu.)	19,981	-	-	-	-	-	19,981
U.S.A. grain							
Carlots	-	-	-	-	-	-	-
Inward cargoes (bu.)	5,929,710	-	-	-	-	-	5,929,710
Outward cargoes (bu.)	1,405,781	-	8,956,213	-	14,581,940	22,866,575	47,810,509
Bin lots (bu.)	140,463	-	-	-	-	-	140,463
Total — cars	28	-	1	-	-	-	29
— bushels	14,660,992	-	10,392,369	-	14,581,940	22,866,575	62,501,876

A-11 — Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1974-75

Point	Wheat	Durum	Oats	Barley	Rye
RECEIPTS					
	— bushels —				
Thunder Bay.	243,425,905	49,084,399	27,260,400	113,196,930	4,350,245
Vancouver.	116,479,346	6,627,528	17,255	38,566,360	1,914,401
Victoria	6,301,626	—	—	—	—
Prince Rupert	18,857,655	—	—	2,006,439	—
Churchill.	276,949	—	—	22,930,918	—
Calgary	266,870	2,087	4,578	4,361,005	207,756
Edmonton	2,662,947	1,882	34,634	2,170,274	—
Lethbridge.	4,498,825	2,233	31,937	87,426	17,527
Moose Jaw	3,202,021	4,107,633	—	386,305	—
Saskatoon	3,754,465	538,129	112,346	2,078,600	—
Total.	399,726,609	60,363,891	27,461,150	185,784,257	6,489,929
SHIPMENTS					
Thunder Bay.	237,464,748	47,666,999	24,272,952	112,130,482	4,200,068
Vancouver.	111,722,100	6,995,129	12,682	37,863,296	1,962,141
Victoria	5,785,567	—	—	4,875	—
Prince Rupert	18,654,029	—	—	2,025,652	—
Churchill.	551,511	—	—	22,187,950	—
Calgary	204,131	2,087	40,493	5,284,448	197,298
Edmonton	2,284,269	1,882	22,922	2,757,198	—
Lethbridge.	5,048,891	2,233	47,714	93,760	70,598
Moose Jaw	926,988	4,829,255	—	1,152,151	—
Saskatoon	2,417,268	528,914	169,542	3,287,910	—
Total.	385,059,502	60,026,499	24,566,305	186,787,722	6,430,105

A-11 – Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1974-75

Point	Flaxseed	Rapeseed	Buckwheat	Mustard Seed	Peas	Miscellaneous
RECEIPTS						
— bushels —						
Thunder Bay.	9,142,096	5,003,222	2,497	1,147,141	71,860	474,780
Vancouver.	3,057,375	25,195,946	452,603	440,817	—	11,823
Victoria	—	—	—	—	—	—
Prince Rupert	—	606,515	—	—	—	—
Churchill.	—	—	—	—	—	—
Calgary	19,638	520,495	—	115,553	—	334
Edmonton	7,270	576,334	—	—	—	105
Lethbridge.	39,462	1,694	—	103,655	—	154,101
Moose Jaw	59,104	15,400	—	55,531	—	360
Saskatoon.	36,858	2,616,059	—	361,029	—	56
Totals	12,361,803	34,535,665	455,100	2,223,726	71,860	641,559
SHIPMENTS						
— bushels —						
Thunder Bay.	8,599,903	4,086,390	2,320	1,091,802	112,368	442,219
Vancouver.	2,379,447	22,637,508	386,565	361,041	—	—
Victoria	36	—	—	—	—	1,400
Prince Rupert	—	607,442	—	—	—	4,878
Churchill.	—	—	—	—	—	—
Calgary	22,820	478,508	—	67,251	—	846
Edmonton	17,061	473,732	—	—	—	174
Lethbridge.	20,921	—	—	51,669	—	137,890
Moose Jaw	80,805	8,257	—	87,749	—	341
Saskatoon.	42,136	2,299,139	—	199,486	—	—
Total.	11,163,129	30,590,976	388,885	1,858,998	112,368	587,748

**A-12 — Carlots Weighed, Leaking or with Defective Seals in the
Western Division
Crop Years 1973-74 and 1974-75**

	Number		% of Total	
	1974-75	1973-74	1974-75	1973-74
Cars weighed in	328,232	341,501	—	—
Inward leaks	23,779	24,741	7.3	7.2
Inward seals missing or defective	9,447	8,789	2.9	2.6
Cars weighed out	22,544	23,877	—	—

**A-13 — Average Reported Outturn Shortage on Vessel Shipments
of Grain from Thunder Bay to Licensed Transfer Elevators,
Crop Year 1974-75**

Grain	Bushels Shipped	Shortage in pounds per 1000 bushels	
		1974-75	1973-74
Wheat	226,897,296	40.64	40.46
Durum Wheat	45,613,345	37.42	40.38
Oats	13,964,693	28.40	25.50
Barley	98,564,425	35.98	39.68
Rye	4,380,709	55.65	42.51
Flaxseed	6,730,577	22.81	43.97
Rapeseed	2,747,155	37.66	75.18
Screenings (in tons).	106,761	1.90/ton	1.54/ton

A-14 — Tough and Damp Grain Dried at Terminal Elevators, Crop Year 1974-75

Point	Artificial drying			Natural Drying	Total
	Tough	Damp	Tough and Damp		
Thunder Bay			— bushels —		
Wheat	49,916,190	1,421,584	51,337,774	9,671,256	61,009,030
Durum	1,101,276	26,122	1,127,398	1,469,362	2,596,760
Oats	453,525	18,579	472,104	1,715,840	2,187,944
Barley ³	9,517,832	574,227	10,092,059	5,838,663	15,930,722
Rye	48,799	4,215	53,014	249,451	302,465
Flaxseed.	457,055	9,371	466,426	237,092	703,518
Rapeseed	25,775	1,636	27,411	9,348	36,759
Buckwheat	—	—	—	—	—
Sunflower Seed ¹	—	—	—	8,054	8,054
Mixed Grain ²	243	—	243	—	243
Mustard Seed	—	—	—	2,969	2,969
Total.	61,520,695	2,055,734	63,576,429	19,202,035	82,778,464
Pacific Coast					
Wheat	18,088,539	238,204	18,326,743	6,533,356	24,860,099
Durum	—	—	—	261,250	261,250
Oats	—	—	—	—	—
Barley	2,477,152	105,428	2,582,580	2,341,560	4,924,140
Rye	—	2,381	2,381	45,181	47,562
Flaxseed.	18,944	—	18,944	9,193	28,137
Rapeseed	—	1,667	1,667	25,958	27,625
Buckwheat	12,170	—	12,170	29,859	42,029
Total.	20,596,805	347,680	20,944,485	9,246,357	30,190,842
Interiors					
Wheat	4,092,772	82,230	4,175,002	59,829	4,234,831
Durum	1,013	2,854	3,867	81,659	85,526
Oats	709	—	709	2,980	3,689
Barley	2,728,631	43,193	2,771,824	80,089	2,851,913
Rye	—	—	—	29,812	29,812
Flaxseed.	—	62	62	3,967	4,029
Rapeseed	—	—	—	18,265	18,265
Mustard Seed	—	—	—	24,369	24,369
Corn	—	59,980	59,980	—	59,980
Total.	6,823,125	188,319	7,011,444	300,970	7,312,414
Churchill					
Wheat	—	—	—	—	—
Barley	—	—	—	149,011	149,011
Total.	—	—	—	149,011	149,011
Total—All Positions.	88,940,625	2,591,733	91,532,358	28,898,373	120,430,731

¹ In bushels of 30 pounds

² In bushels of 50 pounds

³ 30,000 bu. straight grade barley artificially dried

**A-15 — Quality Data for Grades of Red Spring Wheat Exported,
Crop Year 1974-75**

	1 C.W. Red Spring		2 C.W. Red Spring		3 C.W. Red Spring	
	13.5	12.5	13.5	12.5	*	*
Test weight, Avery, lb./bu. . . .	66.4	66.8	65.0	65.1	65.9	63.9
1000 kernel weight, g..	28.9	28.8	28.3	29.2	29.8	29.5
Wheat protein, %**	13.8	13.4	13.9	13.1	13.1	13.1
Falling number, sec.	415	380	335	360	370	330
Flour protein content, %*** . .	12.9	12.6	13.0	12.2	12.2	12.2
Flour yield, %	76.0	75.9	75.8	75.4	74.8	73.7
Flour ash content, %	0.46	0.46	0.48	0.48	0.48	0.54
Flour diastatic activity, mg. . .	182	179	207	198	200	241
Baking absorption, %	62.0	61.0	62.0	62.0	62.0	62.0
Loaf volume, cc.	855	835	865	815	810	750

* Not segregated by protein content.
 ** 13.5% moisture basis.
 *** 14.0% moisture basis.

A-16 — Carlot Inspections Appealed, Crop Year 1974-75

Item	Carlots	Percentage
Left as graded	520	86.5
Grades raised	81	13.5
Grades lowered	—	—
Dockage lowered	—	—
Totals	601	100.0

A-17 — Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1975

Port of Discharge	Wheat	Oats	Barley	Rye	Flax-seed	Rape-seed
— cents per bushel —						
Georgian Bay Ports, Goderich Sarnia and Walkerville	9.23	9.42	8.55	12.5	—	—
Port Colborne	12.14	—	—	18.0	—	—
Toronto	14.08	13.5	16.47	15.25	15.91	—
Kingston	13.63	—	13.75	—	—	—
Prescott	14.8	13.28	14.58	—	—	—
Montreal	15.42	13.77	14.72	15.54	—	17.65
Sorel	15.56	14.53	15.01	—	—	—
Three Rivers	15.69	13.99	14.97	15.25	—	—
Quebec	15.58	13.66	14.5	—	—	—
Baie Comeau	15.46	—	14.63	15.75	—	—
Port Cartier	15.5	—	14.6	15.69	—	—
Halifax	28.19	—	28.3	—	—	—
Other Maritime	63.0	49.0	59.18	—	—	—
Buffalo	—	—	19.88	22.54	—	—
Chicago	—	—	—	12.0	—	—
Manitowoc	—	—	13.6	—	—	—
Milwaukee	—	—	13.79	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

A new section was added to the Regulations, effective April 1, 1975, to permit transportation of feed grain from the Western Division to the Eastern Division without official inspection.

Schedule D was amended, effective April 1, 1975, to provide a revised maximum tariff for licensed transfer elevators. This included combined elevation rates for receiving and shipping grain, and a revised basis of rates for drying grain.

A detailed study and revision of the Regulations were completed in May and the new Regulations, approved by Order in Council P.C. 1975-1530, became effective August 1, 1975.

Schedule VII "Maximum Tariff - Primary Elevators", effective August 1, 1975, provided for an increase of $1\frac{1}{2}\text{¢}$ per bushel, to 12¢ per bushel, in the maximum elevation rate; and a maximum cleaning charge of 5¢ per bushel.

Schedule VIII "Maximum Tariff" - Terminal Elevators", effective August 1, 1975, included an increase of $\frac{1}{2}\text{¢}$ per bushel in rates for elevation, a rate of 5¢ per bushel for cleaning grain, and an increased rate of 12¢ per bushel for drying grain.

Western Grain Standards Committee as at December 31, 1975

H. D. Pound A. Schaen Dr. G. N. Irvine P. Edwards	Chief Commissioner Chief Grain Inspector Chief Chemist Chairman, Grain Appeal Tribunal	}	Canadian Grain Commission
Dr. J. W. Morrison J. B. Russell	representing the Canada Department of Agriculture	}	
C. W. Gibbings	representing the Canadian Wheat Board		
N. H. McClure W. W. Sisler	representing processors of grain	}	
G. E. Gould R. K. Lester	representing exporters of grain	}	
John I. Miller R. E. Hadland Hubert N. Anderson H. R. Patching Elmer Kure Gordon South Devone R. Clark Avery K. Sahl Frank Dietz D. E. Campbell Wm. A. Ronald A. Bos	representing producers of western grain	}	

Eastern Grain Standards Committee as at December 31, 1975

H. D. Pound A. Schaen Dr. G. N. Irvine	Chief Commissioner Chief Grain Inspector Chief Chemist	}	Canadian Grain Commission
Dr. J. W. Morrison	representing the Canada Department of Agriculture		
J. P. Levesque C. F. Bowker F. J. Reid M. Pardo	representing processors and exporters of grain	}	
M. R. McDougall Clarence Wilson Gus Sonneveld Kenneth Patterson	representing producers of eastern grain	}	
Fernand Beaudet E. M. Jones G. C. Nichols	additional*	}	

* Appointed pursuant to Section 17 (3) (e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Red Spring Wheat</i> Crop Bulletin	Annually
<i>Canadian Amber Durum Wheat</i> Crop Bulletin	Annually
<i>Canadian Barley</i> Crop Bulletin	Annually
<i>Canadian Flax and Rapeseed</i> Crop Bulletin	Annually
<i>Canadian Wheat Cargoes</i> Bulletin	Quarterly
<i>Canadian Durum Cargoes</i> Bulletin	Quarterly
<i>Map of Western Canada Showing the Protein Content of Hard Red Spring Wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Grain Grading Handbook for Eastern Canada</i>	
<i>Grain Grading Handbook for Western Canada</i>	
<i>Varietal Identification of Barley, Wheat and Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain through a Primary Elevator</i>	
<i>The Key to Canada's Certificate Final is Uniform Quality</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1975 Annual Report.

APPENDIX D

Revenue and Expenditure

Earned revenue and net expenditure of the Commission, including the Canadian Government Elevators, for the fiscal year 1974-75, compared with 1973-74, were as follows:

	1974-75	1973-74
Revenue	\$13,173,969	\$10,895,778
Expenditure	21,204,285	16,956,099

Further information is given in the following tables.

D-1 — Earned Revenue and Net Expenditure, by Points and Divisions, Fiscal Year ended March 31, 1975

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total
REVENUE							
	— dollars —						
Winnipeg*	2,855	94,316	47,214	187,370	874	7,010,987	7,343,616
Churchill	—	97,566	16,945	—	—	—	114,511
Saskatoon	—	72,314	32,477	—	—	—	104,791
Moose Jaw	—	28,764	103	—	—	—	28,867
Lethbridge	—	51,387	348	—	—	—	51,735
Calgary	1	58,960	35,788	—	—	—	94,749
Edmonton	—	36,540	54	—	—	—	36,594
Vancouver	—	1,032,758	530,197	71,657	—	—	1,634,612
Victoria	—	48,823	22,473	—	—	—	71,296
Prince Rupert	—	124,967	63,323	—	—	—	188,290
Thunder Bay	—	2,206,633	1,095,747	167	—	—	3,302,547
Toronto	—	20,795	—	—	—	—	20,795
Chatham	—	102,298	—	—	—	—	102,298
Montreal	—	28,656	—	25,684	—	—	54,340
Baie Comeau	—	5,129	13,033	—	—	—	18,162
Port Cartier	—	2,726	—	—	—	—	2,726
Quebec	—	3,123	—	—	—	—	3,123
Three Rivers	—	15	—	—	—	—	15
Sorel	—	902	—	—	—	—	902
Totals	2,856	4,016,672	1,857,702	284,878	874	7,010,987	13,173,969

Note: (*) Revenue and Expenditure for all Government Elevators shown opposite Winnipeg

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Super- annuation	Total
EXPENDITURE								
	— dollars —							
Winnipeg*	648,507	1,551,285	455,969	703,025	1,996,970	6,357,911	1,460,000	13,173,667
Churchill	—	15,555	17,151	—	—	—	—	32,706
Saskatoon	35,559	157,169	36,742	—	—	—	—	229,470
Moose Jaw	—	80,692	—	—	—	—	—	80,692
Regina	35,812	—	—	—	—	—	—	35,812
Lethbridge	—	92,444	—	—	—	—	—	92,444
Calgary	15,551	318,216	46,674	—	—	—	—	380,441
Edmonton	—	106,082	—	—	—	—	—	106,082
Vancouver	—	955,621	665,135	233,378	—	—	—	1,854,134
Victoria	—	52,028	34,613	—	—	—	—	86,641
Prince Rupert	—	82,967	71,107	—	—	—	—	154,074
Thunder Bay	—	2,326,830	1,360,505	307,234	—	—	—	3,994,569
Toronto	—	28,337	—	—	—	—	—	28,337
Chatham	—	190,220	—	—	—	—	—	190,220
Montreal	—	497,284	23,262	59,535	—	—	—	580,081
Baie Comeau	—	42,413	13,190	—	—	—	—	55,603
Port Cartier	—	36,072	—	—	—	—	—	36,072
Quebec	—	49,490	—	—	—	—	—	49,490
Three Rivers	—	10,133	—	—	—	—	—	10,133
Sorel	—	8,115	—	—	—	—	—	8,115
Harrow	25,502	—	—	—	—	—	—	25,502
Totals	760,931	6,600,953	2,724,348	1,303,172	1,996,970	6,357,911	1,460,000	21,204,285

Note: (*) Revenue and Expenditure for all Government Elevators shown opposite Winnipeg

D-2 — Summary of Operations by Divisions, Fiscal Year Ended March 31, 1975

	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Total	
REVENUE								
				— dollars —				
Fees	—	3,946,536	1,843,632	284,251	—	—	6,074,419	
Overtime.	—	33,437	14,034	—	—	—	47,471	
Express Charges	—	5,591	—	—	—	—	5,591	
Samples Sold	—	30,458	—	—	—	—	30,458	
Refund of Previous Year's Expenditures	—	650	36	177	362	—	1,225	
Miscellaneous.	2,856	—	—	450	512	—	3,818	
Grain Handling Charges . .	—	—	—	—	—	7,010,987	7,010,987	
Totals	2,856	4,016,672	1,857,702	284,878	874	7,010,987	13,173,969	
	Executive and Admin- istration	Inspection	Weighing	Economics and Statistics	Research Laboratory	Canadian Government Elevators	Super- annuation	Total
EXPENDITURE								
				— dollars —				
Personnel Costs. .	456,677	5,593,682	2,382,084	888,995	971,001	2,838,780	1,460,000	13,131,219
Travel	52,703	195,823	81,510	14,717	22,438	28,018	—	395,209
Postage, Freight and Cartage. . .	21,034	123,684	901	1,620	9,881	5,878	—	162,998
Telephone and Telegraph	13,091	42,465	9,950	21,086	11,217	37,546	—	135,355
Advertising	250	41	—	25	—	—	—	316
Departmental Publications. . .	9,353	11	—	18,628	11,616	—	—	39,608
Professional and Special Services	34,375	13,476	2,416	13,287	18,055	133,211	—	214,820
Rent—Buildings . .	125,433	283,848	32,959	124,306	538,638	22,825	—	1,128,009
—Equipment . . .	11,873	3,771	2,391	163,859	4,067	6,044	—	192,005
Purchased Repair and Upkeep . . .								
—Buildings and Works	598	1,091	48	—	11,119	76,411	—	89,267
—Equipment . . .	1,319	4,915	296	3,172	9,667	3,127	—	22,496
Utilities.	416	3,505	211	1,488	120	257,524	—	263,264
Grants in lieu of Taxes	—	—	—	—	—	511,996	—	511,996
Screenings	—	—	—	—	—	263,122	—	263,122
Printing and Stationery	22,674	69,705	6,260	29,265	23,647	15,915	—	167,466
Other Materials and Supplies . .	1,185	84,139	201,476	1,806	94,907	355,753	—	739,266
Grants and Contributions . .	—	—	—	—	1,197	—	—	1,197
Contraction/ Acquisition . . .								
Bldgs.	1,370	311	—	7,334	—	11,545	—	20,560
Office Equipment .	8,580	7,696	1,794	13,289	7,591	9,093	—	48,043
Other Capital Equipment	—	172,790	2,052	295	261,809	1,781,123	—	2,218,069
Totals	760,931	6,600,953	2,724,348	1,303,172	1,996,970	6,357,911	1,460,000	21,204,285

APPENDIX E

CANADIAN GRAIN COMMISSION

Chief Commissioner	H. D. Pound
Commissioner	C. L. Shuttleworth
Commissioner	F. M. Hetland

COMMODITY EXCHANGE SUPERVISOR W. R. Folliott	GRAIN APPEAL TRIBUNAL Chairman: P. Edwards	EXECUTIVE DIRECTOR E. E. Baxter Financial Officer	ASSISTANT COMMISSIONERS Winnipeg Regina Saskatoon Calgary Harrow	2 2 1 2 1
		R. A. Kullman	G. R. Cobbe J. H. Davidson G. Marshall R. Clark	2 2 1 2 1

49

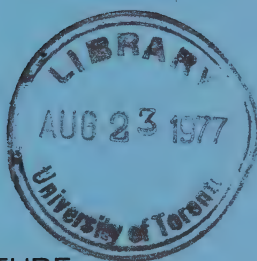
INSPECTION Director A. Schaen	WEIGHING Director J. S. T. Swanson	ECONOMICS & STATISTICS Director L. C. Rayner	RESEARCH LABORATORY Director Dr. G. N. Irvine	GOV'T. ELEVATORS General Manager W. E. Turner
Staff Winnipeg Montreal Chatham Toronto Thunder Bay Saskatoon Moose Jaw Lethbridge Calgary Edmonton Vancouver Victoria Prince Rupert Baie Comeau Port Cartier Three Rivers Sorel Quebec	Staff Winnipeg Montreal Thunder Bay Saskatoon Calgary Vancouver Victoria Prince Rupert Baie Comeau Abbotsford	Staff Winnipeg Montreal Thunder Bay Vancouver	Staff Winnipeg	Staff Winnipeg Saskatoon Moose Jaw Lethbridge Calgary Edmonton Prince Rupert
84 34 15 2 185 10 5 6 20 7 82 4 5 4 4 2 2 4	16 3 120 4 4 51 3 4 1 1	39 4 23 16	82	14 50 23 15 26 30 32 190
475	207	82	82	

Report of the

Government
Publications

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DA12
- A56

CANADIAN GRAIN COMMISSION 1976



AGRICULTURE
CANADA

Minister
Hon. Eugene Whelan

Deputy Minister
L. D. Hudon

Report of the

CANADIAN GRAIN COMMISSION 1976



AGRICULTURE
CANADA

Minister
Hon. Eugene Whelan

Deputy Minister
L. D. Hudon

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CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba,
February 28, 1977.

The Honourable Eugene Whelan, M.P.,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

We are pleased to submit the 1976 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act.

The report contains a review of the Commission's principal activities during the year, together with information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1975-76 crop year, and a review of the quality of 1976 grain crops.

Respectfully submitted,

H. D. Pound,
Chief Commissioner.

C. L. Shuttleworth,
Commissioner.

George G. Leith,
Commissioner.

R. S. Allen
Corresponding Secretary

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INTRODUCTION

The Canadian Grain Commission is responsible for administering the Canada Grain Act and exercises general supervision over grain handling in Canada. It has the power to make regulations and orders that are consistent with the Act.

The Inspection Division provides official inspection and grading of grain at various points across Canada, particularly grain received at and shipped from terminal elevators, and grain loaded to vessels for export at transfer elevators.

The Weighing Division is responsible for the official weighing of grain at terminal, transfer and process elevators, weigh-overs of grain stocks, and also inspection and certification of scales in terminal and transfer elevators.

The Economics and Statistics Division conducts economic research, publishes complete data on the storage and handling of grain within the licensed elevator system, licenses and supervises the bonding of elevators and grain dealers, carries out the registration of terminal and transfer elevator receipts, and provides documentation services to the industry for all grain unloads at licensed terminal elevators. Under the Western Grain Stabilization Act, the Division collects the producers' levy from firms that deduct the levy on grain purchases.

The Research Laboratory carries on a program of research related to the quality of cereal grains and oilseeds, conducts quality surveys of current crops and shipments, and tests new varieties in collaboration with plant breeders and the Commission's Inspection Division.

The Canadian Government Elevators system, which is managed, operated and maintained by the Commission, is comprised of five inland terminals and one seaboard terminal.

The Assistant Commissioners, acting as representatives of the Commission, supervise the licensed primary elevators, deal with producer enquiries and complaints and attend farm meetings relating to the handling and quality control of grains and oilseeds.

In addition, the Commission constitutes Grain Appeal Tribunals, and Western and Eastern Grain Standards Committees. It administers the Grain Futures Act which involves supervision of grain futures trading, and also has responsibility for setting maximum lake grain freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

SECTION 1—GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1975-76

The most significant developments in the 1975-76 crop year were the substantial increases in the volumes of producer marketings and export clearances of Canadian grains and oilseeds. Consequently activity increased throughout the entire grain-handling system.

Total stocks of the principal Canadian grains and oilseeds carried over into the 1975-76 crop year were estimated at 596.8 million bushels, the smallest inward carry-over since the 1962-63 crop year. On the other hand, the total 1975 production of these grains—1,469.6 million bushels—was slightly greater than the previous ten-year average (1,397.3 million bushels). The carry-over plus production provided an available supply of 2,066.4 million bushels for Canadian domestic use and export during the 1975-76 crop year.

Producers' deliveries of the major grains and oilseeds to the licensed elevator system—898.4 million bushels—increased 20% over the previous crop year and represented the third largest figure ever recorded. Marketings of all grains were higher than in 1974-75.

Bulk exports (not including processed products) totalled 686.1 million bushels. This was an increase of 25% over 1974-75 and represented the largest volume exported since 1972-73 when a record 798.3 million bushels were cleared. All grains except flaxseed recorded increased exports over the previous crop year.

The available supplies were reduced a further 778.9 million bushels by domestic use, that is to say, utilization for human food, animal feed, seed and industrial processing. Combined with the bulk exports and exports of processed products, the total disposition was 1,496.3 million bushels. This left a carry-over on July 31, 1976 of 570.1 million bushels, about 4% lower than a year earlier. Approximately 31% of these stocks were located on farms.

Further details on the supply and disposition of Canadian grain are contained in Table 1 of Appendix A.

Quality of Grain Marketed in 1975-76

Red Spring Wheat. Red spring wheat marketed by producers in Western Canada during the 1975-76 crop year amounted to 430.0 million bushels (11.7 million tonnes), an increase over the 367.6 million bushel (10.0 million tonnes) marketings in the previous crop year. The railway carlot movement during the crop year showed the distribution between the grades as follows: No. 1 Canada Western Red Spring, 21.7%; No. 2 C.W.R.S., 31%; No. 3 C.W.R.S., 17.8%. Over 12% of country elevator carlot shipments had a moisture content in the tough and damp range.

The predominant grade exported from Atlantic ports (including Thunder Bay) during the crop year was No. 3 C.W.R.S., followed in order by No. 2 C.W.R.S. 12.5%, No. 2 C.W.R.S. 13.5%, No. 1 C.W.R.S. 13.5%, No. 1 C.W.R.S.

12.5%, and No. 2 C.W.R.S. 11.5%. At the Pacific Coast, the predominant grade exported was No. 3 C.W.R.S. followed in order by No. 1 C.W.R.S. 12.5%, No. 1 C.W.R.S. 13.5%, No. 2 C.W.R.S. 12.5%, No. 2 C.W.R.S. 11.5%, No. 2 C.W.R.S. 13.5%, and No. 1 C.W.R.S. 11.5%. A small quantity of No. 2 C.W.R.S. with no guarantee as to protein content was also shipped from the Pacific Coast during the crop year. Test weight values were about equal or higher than in the previous crop year for most grades exported through Atlantic ports. Flour yields were slightly lower for most grades but baking absorption levels were significantly higher for the 1975-76 Atlantic cargo shipments. Loaf volumes were about the same as in the previous crop year. For Pacific wheat exports, test-weight levels were slightly higher in 1975-76 compared with the previous year; flour yields were higher, and baking absorption significantly higher. Loaf volumes, however, were about the same.

Amber Durum Wheat. Producers' marketings of amber durum wheat in the 1975-76 crop year totalled 84.8 million bushels (2.3 million tonnes) an increase of over 75% from the 48.3 million bushel level (1.3 million tonnes) of the 1974-75 crop year. Slightly under 18% of the railway carlot movement in the crop year graded No. 1 and No. 2 C.W.A.D.; over 32% graded No. 3 C.W.; 6% Extra No. 4 C.W.; 30% No. 4 C.W. and 7% No. 5 C.W. Slightly under 6% of the movement was classed tough. Kernel weight was higher for most grades in the 1975-76 crop year, but semolina yield was lower for most grades. Semolina pigment levels were high for all grades except No. 5 C.W. Spaghetti color was generally satisfactory for all grades.

Exports from Atlantic ports during the crop year represented 85% of the total. Test weight and 1000 kernel weight of these shipments were little changed from those of the previous crop year. Semolina pigment levels were generally a little higher but spaghetti color was about the same as in the previous year. Pacific durum exports included only two grades, No. 3 and No. 4 C.W. They were lower in protein content, semolina and spaghetti pigment content, and were of slightly poorer spaghetti color than corresponding grades of Atlantic shipments.

Barley. Barley marketed in Canada in the 1975-76 crop year totalled 215.2 million bushels (4.7 million tonnes) a very slight increase from the 209.2 million bushel level in 1974-75. Exports of malting barley during the crop year totalled 7.6 million bushels; 4.0 million of two-row barley and 3.6 million of six-row barley. The proportion of the carlot movement of barley qualifying for the Canada Western or malting grades was even lower this year than last, with 4% representing the six-row grades and 3% the two-row grades. The predominant grade was No. 1 Feed, accounting for over 63% of the carlot movement; 13% of the barley marketed in the crop year was graded tough or damp.

The kernel weight of the 1975-76 barley was significantly higher for all grades than that of the previous crop year. The percentage of plump barley was higher this past year for the two-row malting barley and for the No. 1 Feed Barley, but was lower for the six-row grades. The enzymatic activity of the malt from the two-row and six-row grades was slightly higher for the current year than for the previous one, but was lower for the No. 1 Feed grade.

Oats. An increase of nearly 28% over the previous year to a level of 51.5 million bushels occurred for oats marketing in Canada. The proportion of the 1975-76 movement entering the grades No. 3 C.W. or higher was 15.7%, down somewhat from the previous year.

Rye. Almost 68% of the carlot movement of rye in the 1975-76 crop year, was of the No. 2 C.W. grade. A total of 4,826 carlots of rye moved forward from primary elevators during the year, an increase of 73% over the previous year.

Flaxseed. Flaxseed marketings during the year totalled 15.5 million bushels (0.39 million tonnes), an increase of nearly one-third over that in the previous crop year. No. 1 C.W. was the predominant grade representing over 92% of the carlot movement. Oil content of the No. 1 C.W. Flaxseed carlots averaged 43.1% (dry basis), down slightly from the 43.3% level for the previous crop year. The protein content of the oil-free meal from No. 1 C.W. Flax was higher this past year, averaging 41.1%.

Rapeseed. The rapeseed carlot movement in the 1975-76 crop year was 60.3 million bushels (1.37 million tonnes), an increase of more than 46% over the volume in the previous crop year. The predominant grade, No. 1 Canada Rapeseed, represented 92.4% of the total movement. The oil content of the No. 1 C.R.S., at 41.5% (8.5% moisture basis) was slightly higher than for the previous year. The protein content of the oil-free meal from the top grade seed was also higher, 35.9%. The erucic acid content of the oil dropped significantly again this year.

Domestic Mustard Seed. Shipments of mustard seed showed a substantial decrease from 1974-75, with only 353 carlots as compared to 784 carlots. The majority of the carlots inspected graded into the No. 1 or No. 2 C.W. Yellow, Oriental or Brown grades.

Domestic Buckwheat. An increase was recorded for carlot inspections during the crop year, with 251 carlots being inspected compared to 190 during the 1974-75 period. The predominant grade was No. 2 Canada.

Eastern White Winter Wheat. Of the 103 carlots of wheat inspected, 93% qualified for the No. 2 Canada Eastern White Winter grade.

Eastern Corn. There was a reduction of approximately 30% in the number of carlots inspected, with inspections decreasing from 523 carlots in 1974-75 to 368 carlots in 1975-76. The predominate grade was No. 2 C.E. Yellow, which accounted for 72% of the inspections.

Eastern Soybeans. The number of carlots inspected decreased from 1,724 in the previous year to 362 in 1975-76. Quality was generally quite good, with 92% of the straight grade soybeans grading No. 1 or No. 2 Canada Yellow.

Eastern Pea Beans. Inspections increased from 38 carlots in the 1974-75 crop year to 65 carlots in 1975-76. The majority of the beans graded into the No. 1 or No. 2 Canada Eastern Pea Bean grades, indicating a good quality crop.

Growing Conditions, Grades and Quality, 1976 Crop

Snowfall during the winter of 1975-76 was below average for much of the Western Canadian grain belt and winter temperatures were much higher than usual. Most of the light snow had disappeared by the end of March. Precipitation was well below normal in April and May, and soil moisture reserves in the southern grain-growing areas were below average. Most of the northern portions of the prairies had adequate reserves. Seeding began much earlier than usual over a large part of the prairies and was completed in most areas by the end of May. Following the seeding there was significant soil drifting in the excessively dry regions of Alberta and Saskatchewan, and high winds interfered with spraying for both weed and insect control. Large areas received much needed rains in early June and by mid-June the crop conditions were generally quite good. The northern part of the prairies received adequate to excessive moisture throughout much of the rest of the growing season. On the other hand, the southern areas, particularly Manitoba and Saskatchewan, became quite dry. Harvesting began before the end of July in the south and progressed rapidly under continued dry conditions. Progress was slower in Alberta, particularly in the Peace River area, because of wet field conditions. Overall, however, weather conditions during harvesting were better than for many years.

Red Spring Wheat. The 1976 crop of Western Canadian red spring wheat was estimated by Statistics Canada (as of Nov. 15, 1976) at 733 million bushels (19.9 million tonnes). The 1976 crop was second only to the 778.6 million bushel crop of 1966. The carry-over from previous crops at July 31, 1976, was estimated at over 238 million bushels (6.8 million tonnes). The Canadian Grain Commission estimated that 70% of the 1976 red spring wheat crop would qualify for the No. 1 C.W.R.S. grade; 21% for No. 2 C.W.R.S.; and 5% No. 3 C.W.R.S., with 4% entering the Canada Utility grades.

Protein content of the 1976 crop averaged 12.8%, slightly below the 13.0 level of the 1975 crop, but well below the long-term average level of 13.7% for the 20-year period 1956-1975. The protein content of No. 1 C.W.R.S., the predominate grade in the 1976 crop, is highest for Alberta, at 13.3%; Saskatchewan No. 1 C.W. Wheat is slightly lower, at 13.1%; while Manitoba No. 1 C.W. is lower still, at 13.0%. The protein content decreases quite markedly in the lower grades.

The Canadian Grain Commission co-operated with the Canadian Wheat Board in a new program to identify and bring forward to market position No. 1 C.W.R.S. of 15.0% protein.

Amber Durum Wheat. The 1976 crop of Western Canadian amber durum wheat was estimated by Statistics Canada (as of Nov. 15, 1976) at a record 100 million bushels (2.72 million tonnes). The distribution between the grades is expected to be as follows: No. 1 C.W., 3%; No. 2 C.W., 26%; No. 3 C.W., 50%; Extra No. 4 C.W., 3%; No. 4 C.W., 15%; and No. 5 C.W., 3%.

Protein content of the 1976 crop averaged 12.9% compared with 13.2% for the 1975 crop. All grades of the new crop (except Extra No. 4 C.W.) are higher in hectolitre weight and 1,000 kernel weight this year. Semolina and spaghetti pigment level are also higher this year than last. Gluten quality for all grades as assessed by the farinogram is similar to that of last year, and spaghetti color is satisfactory.

Barley. The 1976 crop of Western Canadian barley was estimated (Nov. 15, 1976) at 445 million bushels (9.7 million tonnes), an increase of 9% from the 409 million bushel (8.9 million tonnes) crop in 1975. About 15% of the new crop is expected to qualify for the malting grades. The predominate grade would be No. 1 Feed and is expected to represent about 74% of the new crop. The percentage of plump barley is significantly lower in the new crop than in the 1975 crop. Nitrogen content of the barley is slightly lower this year than last and the enzymatic activity of the barley is also lower.

Flaxseed. The 1976 crop of Western Canadian flaxseed was estimated at 11.7 million bushels (297.2 thousand tonnes), about two-thirds of the 1975 production. The crop was harvested in good condition and about 95% is expected to qualify for the grade No. 1 Canada Western. Oil content of the 1976 crop averages 43.0%, somewhat higher than the 42.1% level for the 1975 crop. The protein content of the oil-free flaxseed meal was lower this year than last, averaging 41.1%. The iodine value of the oil is 192 units this year.

Rapeseed. The 1976 crop of Western Canadian rapeseed was estimated at 41.0 million bushels (932 thousand tonnes), a marked drop from the 77.1 million bushel (1.75 million tonnes) crop in 1975. Low erucic acid varieties of rapeseed accounted for 98.4% of the 1976 acreage, and the erucic acid content of the rapeseed oil dropped to 2.3% for the new crop from a level of 3.1% for the 1975 crop. The oil content of the new crop rapeseed averages 41.3% (8.5% moisture basis), the same level as in the previous crop. The protein content of the oil-free rapeseed meal is a little lower this year averaging 36.4%.

Eastern White Winter Wheat. The 1976 crop of white winter wheat grown in south-western Ontario in 1976 was estimated at 24.6 million bushels (670 thousand tonnes), a modest increase from the 22.4 million bushel crop in 1975. The protein content of the 1976 crop averages 9.7%, a full percentage point lower than the level of the 1975 crop.

Eastern Canadian Soybeans. Production of soybeans in Eastern Canada in 1976 was estimated at 9.2 million bushels (252 thousand tonnes), a decrease of over 31% from 1975 production. The oil content of the 1976 soybean crop averages 19.7% (moisture-free basis) compared with 20.8% for the 1975 crop. The protein content of the oil-free soybean meal averages 51.7%, compared with 52.5% for the 1975 crop.

Eastern Corn. Despite adverse planting conditions, the area sown to corn increased by about 100,000 acres over that sown in 1975. This increased acreage produced a record crop estimated at 144.7 million bushels (3.7 million metric tonnes) which barely exceeded the previous record of 143.5 million bushels set in 1975, but far short of what might have been expected had normal growing and harvesting conditions prevailed. The predominate grades were No. 2 and No. 3 C.E. Yellow.

A survey of some typical samples of the 1976 corn crop for nine of the counties in south-western Ontario showed average values for oil content of 3.9% and for protein content of 10.2% (dry basis).

Meetings of Grain Standards Committees

The Western Grain Standards Committee met in Winnipeg on November 1 and 2, 1976. The main topics of discussion were the proposed changes to the grade schedules for amber durum wheat, western winter wheat, utility wheat, oats, barley, rye, flaxseed, rapeseed, domestic mustard seed and peas; and the relatively high quality of the 1976 crops. The Committee recommended that the proposed grade changes, with some modifications and deletions, be adopted; and agreed in principle with a further proposal for the establishment of experimental grades for unlicensed varieties of wheat and barley marketed under special arrangements such as the Canadian Wheat Board Market Development Program. They also recommended the establishment of 33 samples as primary standards and 6 samples as export standards for the 1976-77 crop year. No. 3 Canada Utility wheat was not included in the 6 samples recommended as export standards.

The Eastern Standards Committee held two meetings. At the September 2, 1976 meeting held in Toronto, Ontario, the Committee recommended 12 samples as standard samples for winter wheat, barley, rye and oats. The Committee discussed the proposed changes to the grade schedules and offered their recommendations. The second meeting was held in Montreal, on November 4, 1976 at which time the Committee recommended 11 samples as standards for corn, soybeans and pea beans. There was considerable discussion on the grading and handling of corn. The Committee was advised that the proposed changes to the flaxseed schedules had been withdrawn by the Commission on the recommendations of the Eastern and Western Grain Standards Committees.

Committee membership as constituted in Section 17 of the Canada Grain Act is listed in Appendix B of this report.

Variety Testing

The Grain Research Laboratory participated in the annual evaluation of the quality characteristics of plant breeders' cultivars of red spring and amber durum wheats and malting barleys grown in the annual co-operative tests. Early in 1976, detailed tests were carried out on 36 cultivars of red spring wheat, 50 cultivars of amber durum wheat, and 24 cultivars of barley.

The Research Laboratory again took part in the annual wheat quality evaluation program of the Crop Quality Council of the United States. The 1976 program included 27 samples representing seven semi-dwarf and conventional height cultivars developed for the red spring wheat area of the upper mid-west United States.

Thirty-five hundred samples of wheat and barley varieties were received by the Inspection Division from Canadian plant breeders for examination and report on visual kernel characteristics. A total of 56 varieties of wheat and 84 varieties of spring and winter barley grown in 1976 Eastern and Western co-operative variety tests were submitted to the Division.

SECTION 2—DOCUMENTATION AND ELEVATOR OPERATIONS

Grain Documentation

Documentation Services. The Economics and Statistics Division provides a documentation and reporting service for inward and outward grain movement at licensed terminal elevators in the Western Division. Basic information is extracted from reports of the Inspection and Weighing Divisions to provide the input to the Division's data processing facilities for production of documents such as Certificates of Canadian Grain, Terminal Receipts and Terminal Elevator Outturns. These documents are produced in Winnipeg or Vancouver for distribution within the grain industry. A telecommunications network enables information to be distributed to the grain-handling companies, the railways and the Canadian Wheat Board. This information becomes direct input to the internal accounting systems of these organizations as well as providing the basis for calculating payments for grains, storage and freight. It is also the source of much of the statistical information which the Division publishes.

Statistics. Licensees are required to submit prescribed records and periodic reports of stocks and handlings of grain as a basis for the Commission's control and supervision of the elevator system. The Economics and Statistics Division also receives corresponding data from other divisions of the Commission, from the Canadian Wheat Board, and from other organizations and associations within the grain trade. From this information the division compiles and publishes comprehensive bulletins relating to the storage and movement of Canadian grain within the Canadian elevator system and to domestic and export markets. Throughout the year these reports were distributed to Canadian and overseas correspondents and also served as a basis for supervisory and regulatory assessments within the Commission, the Canadian Wheat Board and related agencies.

As the principal source of Canadian grain storage and handling statistics, the Division worked closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, the Canada Grains Council, and other federal and provincial government offices. On a correspondent basis, it exchanged data and provided statistical assistance internationally with the Commonwealth Economic Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the United States Department of Agriculture.

Summary statistics pertaining to the 1975-76 crop year appear in the tables forming part of Appendix A and a list of the principal statistical releases is included in Appendix C.

Licensing and Bonding. As at August 1, 1976, the Commission issued a total of 4,049 licences for all elevator categories compared with 4,258 a year earlier, plus 29 grain dealer licences compared to 37 the year previous. Total licensed storage capacity decreased to 625,626,960 bushels from 638,054,410 bushels. A reduction of 11.6 million occurred in the primary elevator system, while terminal elevator capacity dropped 1.5 million. The process elevator capacity reflected an increase of 1.1 million while transfer storage dropped 0.5 million from a year ago.

Guarantee bonds executed by 20 surety companies were deposited with the Commission as security by the licensees during the 1975-76 crop year.

Terminal, transfer and primary elevator licensees were required to maintain adequate insurance on grain stocks in their licensed premises. The insurance policies supporting this coverage were filed with the Economics and Statistics Division, which in turn verified the adequacy of this coverage by comparison with regular stock reports submitted by licensees.

Registration. Operators of terminal and transfer elevators are required to issue terminal or transfer elevator receipts, for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration, become negotiable documents to be used as collateral by the grain companies in financing the movement of grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver and Montreal, the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipment.

Primary Elevators

Inspection of Elevators. The Commission has Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Calgary, to keep the Commission in close touch with the operations of licensed primary elevators in the Prairie Provinces. In the Eastern Division, the Assistant Commissioner is located at Harrow, Ontario.

During 1976, the Assistant Commissioners inspected 491 elevators in Manitoba, 1,303 in Saskatchewan, and 435 in Alberta, a total of 2,229. This inspection included checks on scales, sieves, moisture meters and certain other equipment; deductions for shrinkage, use of authorized forms, and posting of current Commission regulations applying to primary elevators.

In addition to their regular program of inspections, the Assistant Commissioners assisted in the investigation of producers' complaints and of reported infractions of the Commission's regulations and orders. They also received and handled numerous inquiries from producers and elevator operators on various matters such as grain grading and movement; participated in special investigations, surveys and projects; and publicized the work of the Commission through contact with both the farm and business community.

Weigh-overs. The results of primary elevator weigh-overs conducted by the licensed grain companies during the 1975-76 crop year are summarized in the following table.

The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners are given authority to deal directly with elevator managers and superintendents where overages or shortages have been reported in excess of acceptable tolerances.

Elevators reporting	1975-76	1974-75
Shortages	379	319
Neither overages nor shortages	46	50
Overages of less than .25%	572	509
Overages of .25% to .50%	271	256
Overages over .50%	122	115
Total number of elevators weighed over	1,390	1,249

Tariff of Charges. The maximum tariff was revised effective September 1, 1976. Differing rates for elevation, cleaning and drying were established for each kind of grain in preparation for the conversion to metric units of measurement in the grain industry. These new maximum rates allowed a moderate increase in elevator charges. In the case of wheat, the maximum rate for elevation was increased from 12¢ per bushel to 13¢ per bushel, and the maximum charge for cleaning to remove dockage, from 5¢ per bushel to 5½¢ per bushel.

Terminal, Process and Transfer Elevators

Services. The staff of the Inspection Division sampled and graded all grain received at and shipped from licensed terminal elevators in the Western Division. The grain at those elevators was weighed under the supervision of the Commission's Weighing Division staff. Similar services were also provided at some licensed process elevators in the Western Division.

Grain loaded into vessels for export at licensed transfer elevators located at St. Lawrence River and Maritime ports was sampled, inspected and certified. Other sampling, inspection and weighing services in the Eastern Division were provided only on request. The Chatham, Ontario, inspection unit sampled and graded a considerable volume of eastern-grown grain for the area's grain trade. Appendix A provides information on the quantity of grain inspected and weighed during the 1975-76 crop year.

Grain Drying. During the 1975-76 crop year about 83.4 million bushels of high-moisture grain were artificially dried at terminal elevators under supervision of the Commission's Inspection Division, a reduction from the 91.5 million bushel quantity processed during the previous year.

Weigh-overs. Audits are periodically conducted by the Commission's Weighing and Inspection Divisions to enable the Commission to determine whether grain-handling operations at elevators have resulted in any excessive overages or shortages in the various types and grades of grain, and to establish the validity of commercial documents covering stored grain. Summaries of the results of each weigh-over are prepared by the Economics and Statistics Division for review by the Commission.

During the 1975-76 crop year, 17 terminal and 21 transfer elevators were subject to such audits.

Inspection of Equipment. Officials of the Commission's Weighing Division carried out 588 inspections on 433 scales in licensed terminal and transfer elevators. These inspections include those of a routine-scheduled nature and also those carried out as a result of any doubt as to continued accuracy of scales in a terminal or transfer elevator.

Plans and specifications for new elevator facilities and alterations to elevators and existing grain-handling equipment were examined to ensure that the facility would be acceptable for licensing. A total of 9 such projects were reviewed, including installation of dust control systems, a cleaning complex and distribution system. When completed, the new facilities and installations were inspected by officials of the Commission.

New Equipment. Ten manually-operated mechanical scales in three elevators were replaced by automated electronic scales and control systems. The new scale equipment, as well as that installed in previous years, was subject to thorough testing by weighing systems inspectors on the staff of the Commission's Grain Weighing Division.

A permanent location was established for the Automated Digital Analyzer, which provided an efficient and modern unitized laboratory to facilitate the Commission's wheat protein segregation system and research programmes. An additional seven grain quality analyzers were purchased and full-scale simulation studies were concluded, to determine the feasibility of using protein analytical units at terminal elevators.

Further installations of pneumatic sample transport systems in terminal elevators were completed. This equipment provides rapid dispatch of samples from sampling stations to the grain inspection offices at the elevators. Additional artificial grading light fixtures were purchased and all units were carefully installed to provide a uniform lighting system for grading in all inspection offices.

Tariffs of Charges. Effective September 1, 1976, the maximum tariffs for terminal and transfer elevators were restructured, in preparation for subsequent conversion to metric units. The revision also included a moderate increase in the maximum allowable rates for most elevator services. However, the maximum storage rate remained at 1/30¢ per bushel per day for terminal elevators and 1/20¢ per bushel per day for transfer elevators.

Canadian Government Elevators

The Canadian Grain Commission manages and operates five inland terminals and one seaboard terminal.

Handlings. Total receipts of grain during the 1975-76 crop year were 39.2 million bushels. This was a substantial decrease from the previous record handling of 53 million during the 1974-75 crop year; however, it was substantially above the historical average of approximately 20 million bushels.

Total shipments of grain were 43.5 million bushels. Included in this amount was 8.8 million bushels of rapeseed moved through the Prince Rupert elevator. This utilization of the facilities at Prince Rupert alleviated a congested situation in the Vancouver terminals and proved very successful for both the exporters and Canadian Government Elevators.

Approximately two thirds of the grain received was wheat, with the balance consisting of oats, barley, rapeseed, flaxseed, mustard seed and corn.

Receipts and shipments at the various terminals were as follows:

Elevator	Capacity	Stocks July 31 1975	Receipts	Shipments	Stocks July 31 1976
		—thousands of bushels—			
Moose Jaw	5,500	2,582	872	3,261	193
Saskatoon	5,500	4,118	7,945	9,883	2,180
Calgary	2,500	1,073	3,703	3,320	1,456
Edmonton	2,350	1,339	4,786	5,029	1,096
Lethbridge	1,250	135	1,360	1,224	271
Prince Rupert	2,250	1,117	20,563	20,829	851
Totals	19,350	10,364	39,229	43,546	6,047

Equipment. The electrical and mechanical rehabilitation program at the Calgary elevator was completed, while the engineering and purchase of equipment for a similar program at Saskatoon was initiated.

At the Prince Rupert elevator, projects involving the installation of a box-car dumper and air pollution control equipment were successfully concluded.

These projects were undertaken to improve operating efficiency, and in some cases, to ensure compliance with safety and anti-pollution requirements.

Complaints and Inquiries

Producers' Complaints. The Commission and the Assistant Commissioners investigated written complaints about producer transactions with operators of licensed primary elevators. In most of the disputes it was possible to arrange satisfactory settlements between the parties concerned.

In addition, the Assistant Commissioners dealt with a variety of informal complaints and, when necessary, advised elevator managers and local superintendents on correct procedures.

Cargo Shortages. When excessive shortages were indicated in the weights of vessel shipments of grain from Canadian lake and seaboard ports, officials of the Weighing Division investigated the loading of the cargoes and reviewed all available information relating to the unloading of the grain at destination. There was no evidence that the reported shortages resulted from defective scales or faulty weighing practices at licensed Canadian elevators.

Quality of Export Shipments. When inquiries were received relating to any quality characteristics of grain shipped to overseas destinations, thorough investigations were carried out by the Inspection Division or the Research Laboratory. Official samples taken from the shipments at the time of loading were studied and subjected to special tests, and detailed reports of the investigations were provided to interested parties.

SECTION 3—RESEARCH, INFORMATION AND OTHER SERVICES

Research

Laboratory Research. The Commission's Research Laboratory has continued its program of basic and applied research relating to quality of cereal grains and oilseeds. Investigations of a variety of enzyme systems in grain and grain products represent a significant part of the research effort this past year. Two carboxypeptidases from germinated Manitou wheat have been isolated and were found to be non-specific in their release of terminal amino acids from proteins and peptides of known amino acid sequence. Affinity chromatography was used to isolate and purify cereal proteolytic enzymes. Changes in the break-down products of proteins and peptides due to the development of proteolytic activity during germination were followed for a red spring and a durum wheat variety. The location in the different parts of the wheat kernel and the amount of alpha-amylase enzymes is being followed during growth and maturation of the wheat kernel as well as in subsequent germination. The development of alpha-amylase during sprouting of durum wheat causes a deterioration in spaghetti-cooking quality due perhaps to the degradation of starch by the residual enzyme in the spaghetti. The mechanism of the attack of alpha-amylase on intact starch granules of barley is being studied; this is of significance in the use of barley in both the brewing industry and in animal feeding. A study of some barley cultivars has to date indicated a lack of inhibitors of malted barley alpha-amylase. This may be of importance in the digestion of barley starch by monogastric animals and chickens. Beta-glucanase activity which is of significance in the brewing and malting, particularly for two-rowed barley varieties, is being studied by viscometric techniques.

Near-infrared spectroscopic reflectance properties of cereals and oilseeds are being studied to obtain a better understanding of this technique, which is being used by the Commission in its segregation at terminal elevators of carlots of wheat on the basis of protein content. A method of measuring wheat hardness has been developed based on measurement of power consumption during grinding at the first break stage of milling.

Research on durum wheat has included a continuation of mixing studies which suggest that the concept of "bound" and "free" water in bread dough appears relevant also in very much stiffer spaghetti dough. A study of the influence of protein content on durum wheat quality indicated that cooking quality and tolerance to overcooking improved as protein content increased.

In the area of barley research, a rapid method for the determination of starch and amylose in barley is being investigated. A sedimentation procedure for the estimation of malting potential of barley has been applied to plant breeders' cultivars in the Canadian plant breeding program, and seems to offer promise as a prediction test in screening early generation material for malting quality.

A rapid procedure for evaluating the "greenness" or chlorophyll content of rapeseed has been developed involving methanol extraction of ground seed and subsequent colorimetric measurement of the green color. A rapid spectrophotometric procedure for the determination of free fatty acids in

flaxseed and rapeseed was developed and published. The Laboratory's recently acquired Newport Quantity Analyzer (nuclear magnetic resonance) was calibrated during the year for the determination of oil content of oilseeds. This instrument was used for the determination of the oil content of the flaxseed and rapeseed samples of the Laboratory's 1976 harvest survey.

A method has been devised to determine dithiocarbamate-type fungicides in suspect seed by gas chromatographic detection of carbon disulfide generated from the fungicide residue by acid hydrolysis. In another study a gas chromatographic method for determining phosphine in wheat has been devised.

Statistical and Economics Studies. The regular program of studies of grain-handling costs was continued by the Economics and Statistics Division during the year. Reports were provided to the Commission members to keep them informed regarding the adequacy of present levels of handling and storage tariffs within the industry. The Division undertook comprehensive background studies in order to convert the Commission's fee and elevator tariff schedules to metric units in accordance with the grain industry's planned conversion program.

A number of statistical research projects related to the segregation of wheat by protein content at terminal elevators were conducted with a view to development of procedures to utilize new protein-testing technology. A computer evaluation of the simulated use of infra-red spectroscopy devices for the segregation of wheat at terminal elevators was continued by the Division.

The Economics and Statistics Division prepared a number of special statistical tabulations of physical and handling characteristics of the primary elevator system for use by various groups studying the grain-handling industry.

Representatives of the Division participated in meetings of the Canadian Wheat Board Grain Transportation Technical Group called to consider proposed modifications to grain-shipping procedures.

Information Program

Publications. The Economics and Statistics Division published and distributed at regular intervals statistics on the movement and storage of grain within the licensed elevator system and on exports of Canadian grain to various destinations.

The Research Laboratory issued and distributed the 1976 wheat protein map and crop bulletins on the Western Canada crops of red spring wheat, amber durum wheat, barley, flaxseed and rapeseed. Information on crops of Eastern white winter wheat and Eastern soybeans was distributed to the trade. Regular quarterly bulletins on the quality of export shipments of red spring and amber durum wheat were prepared. A separate annual report of the Laboratory's scientific activities was also published.

Members of the staff of the Grain Research Laboratory published a total of 18 scientific and technical papers that appeared in 8 scientific journals.

Meetings. Commissioners and senior officials addressed a number of annual meetings of producer organizations to discuss subjects of current interest related to the Commission's activities and responsibilities. They also attended a number of other meetings of organizations interested in the storage, transportation and marketing of grain.

In addition, regular annual meetings of the Western and Eastern Grain Standards Committees were convened by the Commission.

Professional and technical staff of the Grain Research Laboratory represented the Commission at 15 scientific and technical conferences, one of which was overseas.

Overseas Visits. Members of the Commission, together with several scientific and technical experts, visited Europe, Great Britain, Japan, the Philippines and Australia to meet with government personnel, staff of research establishments, importers, millers and processors. Detailed information on Canadian grains and oilseeds, particularly the 1976 crops, was provided. Matters such as grain inspection and certification, quality research, marketing, transportation and storage were also discussed.

Tours of Commission Facilities. Missions from Japan, Algeria, Ghana, Finland, Nigeria, and Norway, as well as officials from Australia, France, New Zealand, Bangladesh, Argentina, Brazil, Colombia, Belgium, England, Poland, Spain, West Germany, Japan, Mexico, and United States, toured Commission facilities during the year.

Tours and lecture sessions were arranged for grain producers, groups of elevator managers, grain company employees and agricultural students.

Canadian International Grains Institute. Commission staff participated as resource persons for the Institute in its courses both in Canada and overseas. Commission facilities were made available for tours and demonstrations as a regular part of the Institute's program. Senior representatives of the Commission continued to serve as members of the Institute's Board of Directors.

Other Services

Pesticide Residue Monitoring. During 1976 the Research Laboratory checked 1,901 cargoes of red spring wheat, amber durum wheat and barley for organochlorine and thiophosphate residues. In addition, a program of monitoring the carlot grain movement in Canada for residues of toxic pesticides was maintained.

Rapeseed Monitoring. Both the domestic and export movement of rapeseed is monitored by the Research Laboratory. Over 2,500 carlots of rapeseed, as well as 152 cargoes of rapeseed were checked during 1976 for oil content, and erucic acid content. In addition, the cargoes were analyzed for chlorophyll or "green color" in the seed. The quality data for the cargoes were supplied to the industry monthly.

Protein Segregation of Wheat. Segregation of red spring wheat by protein content was effectively maintained during the year at the terminal elevators.

Cargoes of both segregated levels consistently satisfied export protein requirements. No formal complaints over guaranteed protein levels were received from Canada's overseas customers.

The Commission's research and testing program of equipment capable of providing consistent and dependable protein determination for wheat was continued in terminals at Vancouver, and was extended to terminals at Thunder Bay. Two types of single-celled protein determination devices utilizing the principle of infra-red spectroscopy received further testing under operational conditions. Further research and testing will be completed and evaluated before the Commission decides on the adoption of this system at terminal elevators.

The Commission co-operated in the design of an experimental program by the Canadian Wheat Board to permit producers to ship selected carlots of high protein wheat.

Entomology Services. The 1975 grain crops in many areas of Western Canada were harvested under adverse weather conditions and therefore had an above-average moisture content. This condition was favourable for the multiplying of insect pests in grain storage facilities and an increased number of infested carlots were detected on arrival at terminal elevators during the 1975-76 crop year.

A control program was established to identify primary elevators which had infestation problems. Shipments from those infested elevators to terminal points were suspended and successful fumigation of grain stocks was required before resumption of carlot shipments.

The Commission's Entomology Section processed over 61,000 grain samples during the year. The Rusty Grain Beetle was the most prevalent insect detected, with the major infestations occurring in Manitoba and Saskatchewan areas, and a lesser number of interceptions at Alberta points.

The Commission also provided an educational program dealing with detection and control of insect infestations at the country elevator level. Lectures on these subjects were given to elevator managers and superintendents, resulting in increased co-operation between the companies and the Entomology Section in dealing with individual problems.

Crops harvested in the 1976 season were generally dry, and a decrease in infestations in stored grain is anticipated.

Monitoring Moisture Meter Performance. The check-test program to monitor the performance of the Model 919 Moisture Meters used by the Inspection Division in all of its offices across Canada was maintained bi-weekly throughout the year. As required, meters are brought into the Research Laboratory for service and repair.

For use with the moisture meter, the Laboratory also prepared new calibration charts, for both 3-inch and 3½-inch cell meters, for the determination of moisture in soft white spring wheat, as well as several other new charts for which a need had arisen. Moisture meter calibration data for all other cereal grains and oilseeds were reviewed and updated as required in order to prepare a complete set of new charts required when the conversion to metric takes place in the grain industry.

Grain Appeal Tribunal. During the crop year 1975-76 a total of 487 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of carlots officially inspected in the Western Division. The grades assigned by the Grain Inspection Division were sustained in 419

cases. Most of the samples reviewed by the Tribunal represented shipments of either wheat or barley and covered a wide range of varieties and grades.

Grading Services to Producers. During the crop year, 39,195 "Subject to Grade and Dockage" and other unofficial samples were inspected for producers and the grain trade. This was a substantial reduction from the previous crop year's 67,193 samples but more in line with what can be expected when the crop is of average quality. The Chief Grain Inspector dealt with 24 complaints from producers relating to special bin carlot shipments. He established that in eight cases the identity of the producer's grain had not been preserved in handling through the primary elevator.

Special Acts Administration

Grain Futures Act. On the recommendation of the Commission, Order in Council P.C. 1976-590 was passed on March 16, 1976, to extend the provisions of the Act to the Winnipeg Commodity Exchange, Winnipeg Commodity Clearing Limited, Vancouver Grain Exchange, British Columbia Grain Shippers' Clearance Association and Lake Shippers' Clearance Association, and to their officers and members.

Following completion of drafting of regulations to facilitate administration of the Act by the Commission and the Supervisor, copies of the proposed regulations were submitted to the organizations affected for review. On April 13, 1976, the Commission met with representatives of the organizations at a formal hearing to receive their submissions relating to the proposal. The revised regulations made by the Commission were subsequently approved by Order in Council P.C. 1976-2626.

Under provisions of the Grain Futures Regulations, the exchanges and clearing houses were required to file with the Commission, lists of their members and copies of their by-laws, rules and regulations.

The supervisor of grain futures trading made frequent visits to the trading floor of the Winnipeg Commodity Exchange to observe procedures used by the members. Similar visits were made on an occasional basis to the Vancouver Grain Exchange. Books and records of the clearing house were examined, from time to time, to ensure that transactions in grain futures were being handled and recorded in a manner acceptable to the Commission.

Western Grain Stabilization Act. Under the Western Grain Stabilization Act, which became effective April 1, 1976, the Canadian Grain Commission is responsible for the collection of the levy paid by producers, including the collection of information on the sales of the six major grains by all producers.

The Economics and Statistics Division set up the procedures to collect the 2% levy and information on individual grain purchases from all licensees in the designated area and from the majority of firms that purchase grain from farmers, but are not licensed under the Canada Grain Act. The funds collected by the Division are immediately forwarded to the Western Grain Stabilization administration.

Inland Water Freight Rates Act. The Commission did not find it necessary to establish any maximum freight rates under the provisions of this statute.

SECTION 4—ADMINISTRATION

Personnel. Personnel services relating to Canadian Grain Commission staff were provided by the Personnel Administration Branch of Agriculture Canada.

Mr. G. G. Leith was appointed a member of the Commission on January 1, 1976, succeeding Mr. F. M. Hetland.

Mr. W. J. McHugh was appointed to the position of Assistant Commissioner at Saskatoon.

Mr. A. Schaen, Director of the Grain Inspection Division, retired at the end of 1976, and Mr. W. E. Turner, General Manager of the Canadian Government Elevators, also retired during the year.

At December 31, 1976, total staff exclusive of the Canadian Government Elevators was 835 compared with 877 at the end of 1975. The staff of the Canadian Government Elevators totalled 194, an increase of 4 since December 31, 1975.

Revenue and Expenditure. Cash receipts and disbursements for the 1975-76 financial year were \$16,963,000 and \$25,526,000, respectively. These amounts indicate an increase of \$533,000 or 6.6% in the net deficit position, when compared with the previous year. Total revenue generated by the various divisions increased by 28.8% over the amount for 1974-75.

Major expenditure increases related to grain-handling activity in the industry were experienced in the personnel areas and, along with contractual salary revisions, occasioned an 18% increase in personnel costs. These costs, including superannuation, totalled \$17,271,000 and represented 67.6% of total disbursements. Capital expenditures amounting to \$4,213,000 were also significantly higher than in the previous year. They were primarily related to Canadian Government Elevator projects including rehabilitation of mechanical and electrical equipment at Calgary and Saskatoon, and installation of an automatic box car unload unit and pollution control equipment at Prince Rupert.

While expenses continued to exceed revenue, increased activity of the inspection and weighing divisions, favourable weigh-over results at Canadian Government Elevators and internal spending restraints combined to maintain a reasonably satisfactory relationship.

The Commission conducts frequent reviews of its schedule of fees for inspection, weighing and documentation services, with a view to recovering approximately 65% to 75% of the total costs of providing services to the grain industry.

Further information is given in the tables in Appendix D.

APPENDIX A

Grain Statistics and Quality

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A-1—Supply and Disposition of Canadian Grains, Crop Year 1975-76*

	Wheat**	Oats	Barley	Rye	Flaxseed	Rapeseed	Totals
—thousands of bushels—							
SUPPLY							
Carry-over July 31, 1975	295,329	73,402	188,509	13,365	8,605	17,633	596,843
Production in 1975	627,515	289,619	437,251	20,585	17,500	77,100	1,469,570
Imports	—	—	—	—	—	—	—
Total Supply	922,844	363,021	625,760	33,950	26,105	94,733	2,066,413
DISPOSITION							
Exports***	450,230	18,196	199,376	11,753	7,681	30,124	717,360
Domestic Use	179,428	265,000	299,455	9,912	3,439	21,688	778,922
Total Disposition	629,658	283,196	498,831	21,665	11,120	51,812	1,496,282
CARRY-OVER (July 31, 1976)							
On Farms (estimated)	58,000	52,000	50,000	3,500	2,000	12,500	178,000
In primary, process and terminal elevators	136,244	23,899	55,940	7,967	11,560	29,362	264,972
In store and afloat to eastern transfer elevators	72,444	2,140	10,622	248	285	—	85,739
In eastern and western mill bins	5,053	416	1	1	—	—	5,471
In transit by rail, eastern and western divisions	21,445	1,370	10,366	569	1,140	1,059	35,949
In store and in transit to the United States	—	—	—	—	—	—	—
Total in store July 31, 1976	293,186	79,825	126,929	12,285	14,985	42,921	570,131

* Subject to revision

** Wheat includes Durum Wheat

*** Includes exports of bulk grain, seed and (except for flaxseed and rapeseed) milled and processed products expressed as grain equivalents.

A-2—Licences in Force and Storage Capacity, August 1, 1976 and 1975

Type of Licence	Licences in force August 1		Licensed storage capacity August 1	
	1976	1975	1976	1975
—bushels—				
Primary Elevator	3,964	4,165	343,894,700	355,467,650
Terminal and Process Elevator	59	66	159,902,960	160,257,460
Transfer Elevator	26	27	121,829,300	122,329,300
Grain Dealer	29	37	*	*
Totals	4,078	4,295	625,626,960	638,054,410

* These licences do not cover grain storage facilities.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1975-76

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Canada Western Red Spring	43,696	21.7	—
Tough 1 Canada Western Red Spring	860	.4	—
2 Canada Western Red Spring	62,470	31.0	—
Tough 2 Canada Western Red Spring	10,247	5.1	—
3 Canada Western Red Spring	35,897	17.8	—
Tough 3 Canada Western Red Spring	13,595	6.7	—
1 Canada Utility	3,563	1.8	—
2 Canada Utility	896	.4	—
3 Canada Utility	17,098	8.5	—
Tough Others	12,312	6.1	—
Damp	1,095	.5	—
Rejected	58	*	—
Others red spring	—	—	—
Total red spring wheat	201,787	100.0	84.8
1 Canada Western Amber Durum	395	1.2	—
2 Canada Western Amber Durum	5,262	16.4	—
3 Canada Western Amber Durum	10,490	32.6	—
Extra 4 Canada Western Amber Durum	1,950	6.1	—
4 Canada Western Amber Durum	9,720	30.2	—
5 Canada Western Amber Durum	2,368	7.4	—
Tough durum	1,810	5.6	—
Others durum	147	.5	—
Total amber durum wheat	32,142	100.0	13.5
Total soft white spring	1,673	42.2	.7
Total mixed wheat	—	—	—
Total Alberta winter wheat	2,291	57.8	1.0
Total all wheats	237,893	100.0	100.0

* Less than 0.05%

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1975-76 (Continued)

Grade	Carlots	Percentage
OATS		
1 Canada Western	—	—
2 Canada Western	27	.2
Extra 3 Canada Western	38	.3
3 Canada Western	2,147	15.2
Extra 1 Feed	1,071	7.6
1 Feed	8,318	58.9
2 Feed	765	5.4
3 Feed	174	1.2
Mixed Feed	—	—
Tough	1,463	10.3
Damp	24	.2
Rejected	55	.4
Others	41	.3
Total oats	14,123	100.0
BARLEY		
1 Canada Western Six-Row	12	*
2 Canada Western Six-Row	3,832	4.0
1 Canada Western Two Row	32	*
2 Canada Western Two-Row	2,870	3.0
1 Feed	60,281	63.3
2 Feed	13,857	14.5
3 Feed	1,786	1.9
Tough	12,102	12.7
Damp	276	.3
Rejected	188	.2
Others	113	.1
Total barley	95,349	100.0

* Less than 0.05%

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1975-76 (Continued)

Grade	Carlots	Percentage
RYE		
1 Canada Western	13	.3
2 Canada Western	3,278	67.9
3 Canada Western	728	15.1
4 Canada Western	192	4.0
Ergoty	6	.1
Tough	594	12.3
Damp	10	.2
Rejected	—	—
Others	5	.1
Total rye	4,826	100.0
FLAXSEED		
1 Canada Western	5,011	92.3
2 Canada Western	166	3.1
3 Canada Western	45	.8
4 Canada Western	10	.2
Tough	150	2.8
Damp	17	.3
Rejected	14	.3
Others	13	.2
Total flaxseed	5,426	100.0
RAPESEED		
1 Canada	14,376	93.3
2 Canada	422	2.7
3 Canada	148	1.0
Others	458	3.0
Total rapeseed	15,404	100.0

* Less than 0.05%

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1975-76 (Concluded)

Grade	Carlots	Percentage
OTHER GRAINS		
Corn	31	1.8
Sunflower seed	141	8.1
Mixed grain	151	8.7
Screenings	438	25.2
Buckwheat	251	14.5
Soybeans	29	1.7
Peas	279	16.1
Sample grain	38	2.2
Safflower seed	6	.3
Mustard seed	353	20.3
Condemned grain	9	.5
Canary seed	10	.6
	1,736	100.0
Grand total	374,757	

A-4—Samples of Western Grain “Subject to Grade and Dockage” and Other Unofficial Samples Inspected, Crop Year 1975-76 Compared with Crop Year 1974-75

Point	1975-76	1974-75
	Number of Samples	
Winnipeg	18,448	34,107
Calgary	3,804	17,592
Edmonton	2,453	1,049
Moose Jaw	479	544
Saskatoon	1,590	2,811
Lethbridge	10,230	9,024
Vancouver	2,191	2,066
Totals	39,195	67,193

A-5—Inward Carlot and Trucklot Re-inspections of Western Grain, Crop Year 1975-76

Point	Inspected	Re- Inspected	Un- changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	231,855	13,864	12,616	1,108	78	14	48
Winnipeg	5,646	951	813	102	20	5	16
Churchill	10,519	443	317	109	9	—	—
Moose Jaw	1,015	14	6	8	—	1	7
Saskatoon	8,525	558	456	78	4	3	12
Calgary	6,810	708	677	22	—	—	9
Edmonton	4,444	687	635	22	5	3	22
Lethbridge	1,848	23	7	11	3	—	2
Prince Rupert	8,481	271	248	15	—	2	6
Vancouver	107,919	5,701	5,210	431	10	3	47
Totals	387,062	23,220	20,985	1,906	129	31	169
Percentage of total carlots and trucklots	100.0	6.0	5.4	.5	*	*	*

* Less than 0.05%

A-6—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1975-76

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	46	2,374	98	143	947
Oats	149	2,231	27	43	1
Barley	245	4,709	152	525	24
Flaxseed	—	50	11	2	13
Rye	—	65	26	—	3
Mixed Grain	1	—	23	6	—
Corn	—	—	—	—	—
Buckwheat	—	—	—	—	—
Peas	17	—	—	—	—
Screenings	145	2,242	31	232	14
Rapeseed	—	142	467	909	3
Sample feed grain	—	—	3	—	—
Mustard seed	—	—	13	—	19
Sample grain	23	72	—	—	—
Sunflower	—	—	—	—	—
Canary seed	—	—	—	—	—
Totals	626	11,885	851	1,860	1,024

Grain	Saskatoon	Lethbridge	Vancouver Victoria and Prince Rupert	Churchill
Wheat	557	41	179	1
Oats	82	1	327	4
Barley	1,220	88	368	1
Flaxseed	12	32	1	—
Rye	—	40	4	—
Mixed Grain	5	—	7	—
Corn	—	10	4	—
Buckwheat	—	—	7	—
Peas	—	—	—	—
Screenings	352	—	470	—
Rapeseed	1,659	14	15	—
Sample feed grain	—	—	—	—
Mustard seed	84	5	96	—
Sample grain	—	—	—	—
Canary seed	1	—	—	—
Sunflower	—	—	—	—
Beans	—	29	—	—
Totals	3,972	260	1,478	6

A-7—Carlot Inspections of Eastern Grain, Crop Year 1975-76

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
1 Canada Eastern White Winter	—	—	2	2
2 Canada Eastern White Winter	—	—	96	96
3 Canada Eastern White Winter	—	—	1	1
4 Canada Eastern White Winter	—	—	1	1
Tough	—	—	2	2
Sample	—	—	1	1
Totals	—	—	103	103
CORN				
1 Canada Eastern Yellow	—	—	20	20
2 Canada Eastern Yellow	11	—	253	264
3 Canada Eastern Yellow	1	—	65	66
4 Canada Eastern Yellow	—	—	7	7
5 Canada Eastern Yellow	—	—	6	6
Tough	—	—	4	4
Sample	—	—	1	1
Totals	12	—	356	368
BEANS				
2 Canada Eastern Pea Beans	—	—	1	1
4 Canada Eastern Pea Beans	—	—	8	8
2 Canada Eastern Light Red Kidney	—	—	48	48
3 Canada Eastern Light Red Kidney	—	—	8	8
Totals	—	—	65	65
SOYBEANS				
1 Canada Yellow	—	—	38	38
2 Canada Yellow	—	—	187	187
3 Canada Yellow	—	—	19	19
4 Canada Yellow	—	—	1	1
Tough	—	—	94	94
Damp	—	—	21	21
Sample	—	—	2	2
Totals	—	—	362	362
Totals, all grains	12	—	886	898

**A-8—Inspections of Eastern Grain in Cargoes, Bins, Trucks or
Warehouses, Crop Year 1975-76**

Grain	Montreal	Toronto	Chatham	Total
		—bushels—		
Wheat	300,529	—	15,591,725	15,892,254
Barley	—	—	21,190	21,190
Corn	—	—	11,775,224	11,775,224
Rye	—	—	715,206	715,206
Beans	—	—	1,673,980	1,673,980
Soybeans	—	667	958,642	959,309
Totals	300,529	667	30,735,967	31,037,163

A-9—Inward and Export Cargoes Sampled and Inspected, Crop Year 1975-76

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Baie Comeau	Port Cartier	Total
				—bushels—				
Eastern grain								
Inward	1,186,133	—	—	—	—	—	—	1,186,133
Export	2,636,501	—	—	—	3,884,050	11,893,676	3,907,455	22,321,682
Western grain								
Inward	1,774,736	—	—	1,433,646	—	—	5,196,060	8,404,442
Export	58,784,449	24,721,557	21,571,099	65,108,490	28,886,968	77,395,817	73,392,395	349,860,775
Totals	64,381,819	24,721,557	21,571,099	66,542,136	32,771,018	89,289,493	82,495,910	381,773,032

A-10—Grain Sampled but not Inspected, Crop Year 1975-76

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern grain							
Carlots	46	—	—	—	—	—	46
Inward cargoes (bu.)	611,855	—	—	—	—	526,661	1,138,516
Outward cargoes (bu.)	591,000	—	—	—	—	—	591,000
Bin lots (bu.)	80,049	—	—	—	—	—	80,049
Western grain							
Carlots	1	—	—	—	—	—	1
Inward cargoes (bu.)	13,067,411	—	438,732	—	—	—	13,506,143
Outward cargoes (bu.)	—	—	—	—	—	—	—
Bin lots (bu.)	—	—	—	—	—	—	—
U.S.A. grain							
Carlots	1	—	—	—	—	—	1
Inward cargoes (bu.)	7,283,757	—	1,091,215	—	—	—	8,374,972
Outward cargoes (bu.)	5,018,922	—	11,265,259	—	10,569,255	29,077,932	55,931,368
Bin lots (bu.)	360,918	—	—	—	—	—	360,918
Totals—cars	48	—	—	—	—	—	48
—bushels	27,013,912	—	12,795,206^a	—	10,569,255	29,604,593	79,982,966

A-11—Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1975-76

Point	Wheat	Durum	Oats	Barley	Rye	Flaxseed
RECEIPTS						
	—bushels—					
Thunder Bay	288,161,298	61,191,370	42,661,276	110,018,880	9,633,233	8,462,350
Vancouver	129,213,409	10,010,687	29,498	78,293,547	1,528,636	3,601,310
Victoria	7,010,387	—	—	—	—	—
Prince Rupert	11,762,535	—	—	2,693	—	—
Churchill	687,886	—	—	22,878,001	—	—
Calgary	223,669	21,259	44,947	1,260,007	84,684	27,529
Edmonton	95,379	2,135	159,847	295,971	—	7,366
Lethbridge	161,081	40,668	25,281	478,143	124,135	75,174
Moose Jaw	365,976	278,037	—	4,925	1,029	29,270
Saskatoon	113,837	5,914	158,543	468,276	549	33,727
Totals	437,795,457	71,550,070	43,079,392	213,700,443	11,372,266	12,236,726
SHIPMENTS						
	—bushels—					
Thunder Bay	284,228,673	63,113,826	39,801,545	116,602,661	8,785,633	4,991,746
Vancouver	124,438,340	9,363,550	17,827	74,303,119	1,831,042	3,753,971
Victoria	6,862,119	—	—	1,708	—	—
Prince Rupert	11,171,236	—	—	5,197	—	—
Churchill	2,140	—	—	23,773,364	—	—
Calgary	413,622	21,259	42,533	1,102,634	93,634	24,506
Edmonton	427,614	2,135	134,539	1,184,570	—	6,137
Lethbridge	135,876	21,935	7,300	413,215	118,862	83,079
Moose Jaw	2,811,584	319,771	—	78,244	1,469	33,960
Saskatoon	1,328,182	5,878	286,908	2,744,276	—	34,841
Totals	431,819,386	72,848,354	40,290,652	220,208,988	10,830,640	8,928,240

**A-11—Gross Quantities of Grain Inspected and Weighed at Terminal
Elevators, Crop Year 1975-76
(Continued)**

Point	Rapeseed	Buckwheat	Mustard Seed	Peas	U.S. Buckwheat	Miscel- laneous
RECEIPTS						
			—bushels—			
Thunder Bay	2,287,397	—	532,985	434,423	—	501,000
Vancouver	20,269,159	627,267	142,815	—	44,748	9,917
Victoria	215	—	—	—	—	—
Prince Rupert	9,124,584	—	—	—	—	—
Churchill	—	—	—	—	—	5,987
Calgary	2,248,147	—	48,150	—	—	436
Edmonton	4,920,779	—	—	—	—	575
Lethbridge	306,148	—	14,184	—	—	155,499
Moose Jaw	958	—	205,714	—	—	3,736
Saskatoon	8,051,119	—	51,101	—	—	4,649
Totals	47,208,506	627,267	994,949	434,423	44,748	681,799
SHIPMENTS						
			—bushels—			
Thunder Bay	1,548,133	—	434,252	328,600	—	363,370
Vancouver	19,498,940	611,052	180,309	—	—	—
Victoria	—	—	—	—	—	—
Prince Rupert	8,919,302	—	—	—	—	18,918
Churchill	—	—	—	—	—	—
Calgary	1,604,627	—	39,729	—	—	—
Edmonton	3,371,547	—	—	—	—	15,434
Lethbridge	283,786	—	55,778	—	—	132,807
Moose Jaw	6,820	—	87,110	—	—	1,980
Saskatoon	5,405,554	—	159,679	—	—	285
Totals:	40,638,709	611,052	956,857	328,600	—	532,794

**A-12—Cars Weighed, Leaking or with Defective Seals in the
Western Division
Crop Years 1974-75 and 1975-76**

	Number		% of Total	
	1975-76	1974-75	1975-76	1974-75
Cars weighed in	367,259	328,232	—	—
Inward leaks	14,872	23,779	4.1	7.3
Inward seals missing or defective	12,838	9,447	3.5	2.9
Cars weighed out	15,242	22,544	—	—

**A-13—Average Reported Outturn Shortage on Vessel Shipments
of Grain from Thunder Bay to Licensed Transfer Elevators,
Crop Year 1975-76**

Grain	Bushels Shipped	Shortage in Pounds per 1000 bushels	
		1975-76	1974-75
Wheat	279,778,330	41.26	40.64
Durum Wheat	61,788,294	41.19	37.42
Oats	31,347,762	32.15	28.40
Barley	104,387,660	29.14	35.98
Rye	8,238,319	63.37	55.65
Flaxseed	4,859,689	45.26	22.81
Rapeseed	1,379,512	53.02	37.66
Screenings (in tons)	83,405	2.40/ton	1.90/ton

A-14—Tough and Damp Grain Dried at Terminal Elevators, Crop Year 1975-76

	Artificial Drying				
Point	Tough	Damp	Tough and Damp	Natural Drying	Total
Thunder Bay					
			—bushels—		
Wheat	51,748,043	1,780,892	53,528,935	9,617,211	63,146,146
Durum	1,681,063	42,139	1,723,202	1,948,732	3,671,934
Oats	1,016,169	71,340	1,087,509	1,771,394	2,858,903
Barley	11,750,277	345,862	12,096,139	5,354,532	17,450,671
Rye	214,198	13,880	228,078	609,728	837,806
Flaxseed	155,326	28,110	183,436	147,246	330,682
Rapeseed	719	—	719	7,112	7,831
Buckwheat	—	—	—	—	—
Sunflower Seed*	—	—	—	741	741
Mixed Grain	—	—	—	—	—
Mustard Seed	—	—	—	—	—
Totals	66,565,795	2,282,223	68,848,018	19,456,696	88,304,714
Pacific Coast					
Wheat	8,163,311	452,556	8,615,867	5,060,372	13,676,239
Durum	89,761	25,268	115,029	270,639	385,668
Oats	—	—	—	—	—
Barley	2,811,939	330,010	3,141,949	2,551,334	5,693,283
Rye	16,202	—	16,202	70,429	86,631
Flaxseed	7,531	2,139	9,670	29,768	39,438
Rapeseed	—	—	—	19,096	19,096
Buckwheat	2,105	2,444	4,549	15,757	20,306
Sunflower Seed*	—	—	—	—	—
Totals	11,090,849	812,417	11,903,266	8,017,395	19,920,661
Interiors					
Wheat	1,167,757	124,902	1,292,659	265,140	1,557,799
Durum	24,902	10,147	35,049	21,958	57,007
Oats	13,363	13,887	27,250	—	27,250
Barley	883,148	22,641	905,789	38,627	944,416
Rye	—	—	—	7,058	7,058
Flaxseed	865	1,076	1,941	3,935	5,876
Rapeseed	7,555	8,349	15,904	10,718	26,622
Mustard Seed	—	—	—	5,402	5,402
Corn**	—	778	778	—	778
Totals	2,097,590	181,780	2,279,370	352,838	2,632,208
Churchill					
Wheat	—	—	—	—	—
Barley	—	—	—	651,614	651,614
Totals	—	—	—	651,614	651,614
Totals—All Positions	79,754,234	3,276,420	83,030,654	28,478,543	111,509,197

* In bushels of thirty pounds

** Canadian Corn—Does not include U.S. Corn

A-15—Quality Data for Grades of Red Spring Wheat Exported, Crop Year 1975-76

Property	1 C.W. Red Spring			2 C.W. Red Spring			3 C.W. Red Spring
	13.5	12.5	11.5	13.5	12.5	11.5	
Test weight, Avery lb/bu	66.5	67.8	68.0	65.1	66.6	67.8	65.1
1000 kernel weight, g	29.0	30.0	31.7	29.0	29.9	32.1	31.1
Wheat protein content, %**	13.6	13.0	12.3	13.7	12.8	11.6	12.7
Falling number, sec	375	390	375	325	370	350	335
Flour protein content, %***	13.1	12.2	11.6	12.9	12.0	11.1	12.0
Flour yield, %	76.4	75.5	75.3	75.1	75.6	75.2	73.8
Flour ash content, %	0.47	0.47	0.47	0.46	0.49	0.49	0.52
Flour diastatic activity, mg	198	214	232	192	229	240	261
Baking absorption, %	64.0	64.0	63.0	64.0	64.0	63.0	65.0
Loaf volume, cc	860	790	740	850	780	705	755

* Not segregated by protein content.

** 13.5% moisture basis.

*** 14.0% moisture basis.

A-16—Carlots Inspections Appealed, Crop Year 1975-76

Item	Carlots	Percentage
Left as graded	419	86.0
Grades raised	66	13.6
Grades lowered	2	.4
Dockage lowered	—	—
Totals	487	100.0

A-17—Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1976

Port of Discharge	Wheat	Oats	Barley	Rye	Flax-seed	Rape-seed
—cents per bushel—						
Georgian Bay Ports, Goderich, Sarnia and Walkerville	9.32	10.89	10.00	12.75	—	—
Port Colborne	12.79	12.75	10.72	14.35	—	—
Toronto	14.83	14.28	17.43	15.75	16.44	—
Kingston	15.27	—	—	—	—	—
Prescott	15.57	13.69	15.45	—	—	—
Montreal	15.97	14.31	15.07	15.94	—	—
Sorel	15.78	14.50	15.77	—	—	—
Three Rivers	15.79	14.00	15.43	15.75	—	—
Quebec	15.83	14.20	15.69	—	16.75	—
Baie Comeau	15.78	—	15.00	—	—	—
Port Cartier	15.78	—	15.00	16.04	—	—
Halifax	30.55	—	29.77	—	—	—
Other Maritime	64.13	55.00	59.71	—	—	—
Buffalo	19.21	—	18.00	18.00	—	—
Chicago	—	—	—	14.00	—	—
Manitowoc	—	—	13.99	—	—	—
Milwaukee	—	—	13.97	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

On July 13, 1976, section 53 of the Regulations was revoked and replaced by a revised section 53 which prescribes new requirements relating to the inspection of grain received at licensed transfer elevators, and the showing of grade and dockage on elevator receipts issued for that grain. Section 57 was amended by adding a requirement relating to elevator receipts issued for foreign grain delivered to transfer elevators.

Several additional amendments were made, effective September 1, 1976. Schedule I—"Fees of the Commission" was revised to provide for an increase of approximately 10% in fees charged for many of the inspection, weighing and other services provided by the Commission.

Schedules VII, VIII and IX "Maximum Tariffs of Elevator Charges" were revised to permit increases in charges for some services by operators of licensed primary, terminal and transfer elevators. In these amended tariffs, provision was made for varying rates for the different kinds of grain, in preparation for conversion to metric weights basis in 1977.

Schedule XI was revised to establish shrinkage allowances on a percentage basis for grain delivered to terminal elevators in railway cars.

A new section 30.1 and Schedule XIV were added to the Regulations to establish prescribed abbreviations for certain words or expressions used in forms, receipts and other documents referred to in the Canada Grain Act and the Regulations.

Minor amendments were made to some other portions of the Regulations to facilitate administration.

Western Grain Standards Committee as at December 31, 1976

H. D. Pound A. Schaen Dr. G. N. Irvine P. Edwards		Chief Commissioner Chief Grain Inspector Chief Chemist Chairman, Grain Appeal Tribunal	}	Canadian Grain Commission
Dr. J. W. Morrison J. B. Russell	}	representing the Canada Department of Agriculture		
F. M. Hetland		representing the Canadian Wheat Board		
N. H. McClure W. W. Sisler	}	representing processors of grain		
G. E. Gould R. K. Lester	}	representing exporters of grain		
John I. Miller R. E. Hadland Hubert N. Anderson H. R. Patching Elmer Kure Gordon South Devone R. Clark Avery K. Sahl Frank Dietz D. E. Campbell Wm. A. Ronald A. Bos	}	representing producers of western grain		

Eastern Grain Standards Committee as at December 31, 1976

H. D. Pound A. Schaen Dr. G. N. Irvine		Chief Commissioner Chief Grain Inspector Chief Chemist	}	Canadian Grain Commission
Dr. J. W. Morrison		representing the Canada Department of Agriculture		
C. F. Bowker F. J. Reid M. Pardo	}	representing processors and exporters of grain		
M. R. McDougall Clarence Wilson Gus Sonneveld Kenneth Patterson	}	representing producers of eastern grain		
Fernand Beaudet E. M. Jones G. C. Nichols	}	additional*		

* Appointed pursuant to Section 17 (3) (e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Red Spring Wheat. Crop Bulletin</i>	Annually
<i>Canadian Amber Durum Wheat. Crop Bulletin</i>	Annually
<i>Canadian Barley. Crop Bulletin</i>	Annually
<i>Canadian Flax and Rapeseed. Crop Bulletin</i>	Annually
<i>Canadian Wheat Cargoes. Bulletin</i>	Quarterly
<i>Canadian Durum Cargoes. Bulletin</i>	Quarterly
<i>Map of Western Canada Showing the Protein Content of Hard Red Spring Wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Grain Grading Handbook for Eastern Canada</i>	
<i>Grain Grading Handbook for Western Canada</i>	
<i>Varietal Identification of Barley, Wheat and Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain through a Primary Elevator</i>	
<i>The Key to Canada's Certificate Final is Uniform Quality</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1976 Annual Report.

APPENDIX D

D-1—REVENUE—By Location and Division Fiscal Year Ended March 31, 1976

LOCATIONS	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Victoria		42	20				62	71
Vancouver		1582	802	122			2506	1635
Prince Rupert		130	66			2361	2557	2410
Lethbridge		27				309	336	862
Calgary		64	47			715	826	722
Edmonton		35				828	863	885
Saskatoon		74	45			1863	1982	1895
Moose Jaw		16				650	666	734
Churchill		141	110				251	115
Winnipeg	8	116	60	320	1	718	1223	339
Thunder Bay		3608	1726				5334	3303
Toronto		16					16	21
Chatham		211					211	102
Montreal		44		42			86	55
Baie Comeau		4	19				23	18
Port Cartier		10					10	3
Three Rivers		3					3	
Quebec		4					4	3
Sorel		4					4	1
Total Current Year	8	6131	2895	484	1	7444	16963	
Total Previous Year	3	4017	1858	285	1	7010		13174

* Elevator & Grain Documentation

** Grain Testing and Research

**D-2—EXPENDITURES—By Location and Division
Fiscal Year Ended March 31, 1976**

LOCATIONS	DIVISIONS							Total Current Year	Total Previous Year
	Superannuation	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
					\$(000)				
Victoria			63	45				108	87
Vancouver			1225	844	255			2324	1854
Prince Rupert			100	69			3645	3814	2122
Lethbridge			101				448	549	529
Calgary		34	269	61			1459	1823	1292
Medicine Hat									
Edmonton			101				706	807	1131
Saskatoon		30	148	42			1056	1276	1394
Moose Jaw			88				558	646	673
Regina		37						37	36
Churchill			37	38				75	33
Winnipeg		632	1405	286	743	2058	254	5378	5615
Thunder Bay			3299	2093	353			5745	3995
Toronto			32					32	28
Chatham			238					238	190
Harrow		29						29	26
Montreal			494	42	56			592	580
Baie Comeau			61	19				80	56
Sorel			53					53	8
Port Cartier			58					58	36
Quebec City			65					65	49
Three Rivers			49					49	10
Superannuation	1748							1748	1460
Total Current Year	1748	762	7886	3539	1407	2058	8126	25526	
Total Previous Year	1460	761	6601	2724	1303	1997	6358		21204

* Elevator & Grain Documentation

** Grain Testing & Research

D-3—REVENUE—By Type and Division
Fiscal Year Ended March 31, 1976

TYPE	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Grain Sales								
—Samples		32					32	30
—Surplus						266	266	174
—Screenings						1150	1150	1063
—Weighovers						710	710	
Services and Service Fees								
—Inspection		6082					6082	3980
—Weighing			2895			49	2944	1937
—Storage						968	968	1101
—Elevation						2644	2644	3380
—Drying						580	580	662
—Cleaning						779	779	370
—Documentation Registration				219			219	133
—Documentation Cancellation				215			215	128
—Other	8	10					18	10
Licenses				48			48	23
Refund of Previous Year Expenditures		5			1	3	9	1
Miscellaneous								
Grade Promotions						151	151	37
Other		2		2		144	148	145
Total Current Year	8	6131	2895	484	1	7444	16963	
Total Previous Year	3	4017	1858	285	1	7010		13174

* Elevator and Grain Documentation

** Grain Testing & Research

D-4—EXPENDITURES—By Type and Division
Fiscal Year Ended March 31, 1976

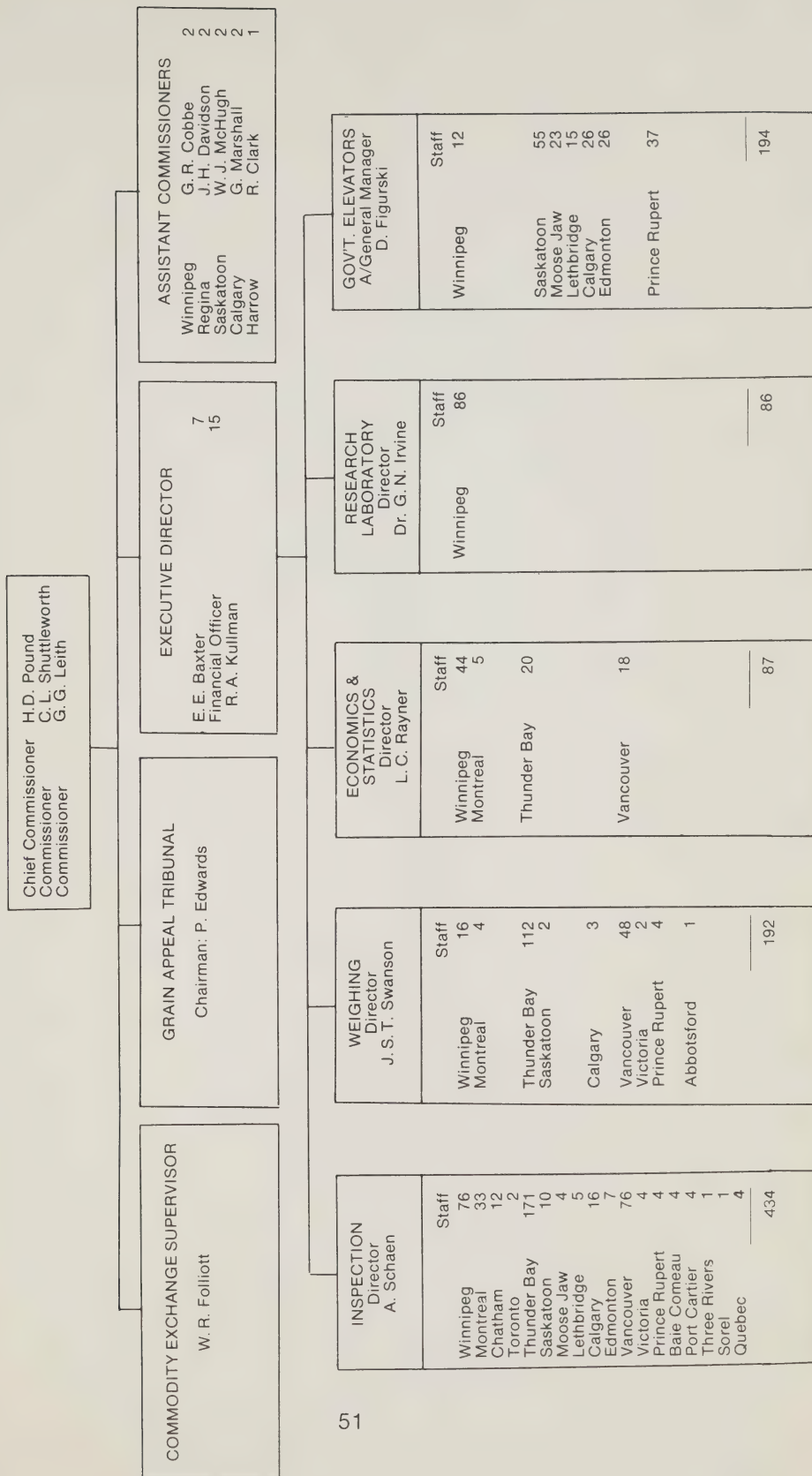
TYPE	DIVISIONS							Total Current Year	Total Previous Year
	Superannuation	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
					\$(000)				
Personnel Costs	1748	518	6620	3325	994	1116	2950	17271	14591
Travel		53	221	132	14	19	30	469	396
Postage, Freight & Cartage		21	134		2	11	8	176	163
Telephone/Telegraph		17	41	13	26	13	38	148	136
Advertising				2				2	1
Dept. Publications		2			18	11		31	40
Prof. & Special Services		10	23	4	3	14	77	131	215
Rent—Buildings		103	290	31	97	474	17	1012	1128
—Equipment		7	3	4	198	4	6	222	192
Purchased Repair and Upkeep									
—Bldgs. & Works		2	2		4	2	52	62	89
—Equipment		2	4		1	6	16	29	22
Utilities			5	1	1		251	258	263
Grants in lieu of Taxes							515	515	512
Screenings							232	232	263
Printing & Stationery		19	39	16	27	28	10	139	167
Other Materials and Supplies		4	54	3	2	111	339	513	539
Expenditures, Other				1		1	100	102	200
Grants & Contributions						1		1	1
Construction/ Acquisition of Buildings			9		3			12	20
Office Equipment		4	11	2	13	3	4	37	48
Other Capital Equipment			430	5	4	244	3481	4164	2218
Total Current Year	1748	762	7886	3539	1407	2058	8126	25526	
Total Previous Year	1460	761	6601	2724	1303	1997	6358		21204

* Elevator & Grain Documentation

** Grain Testing & Research

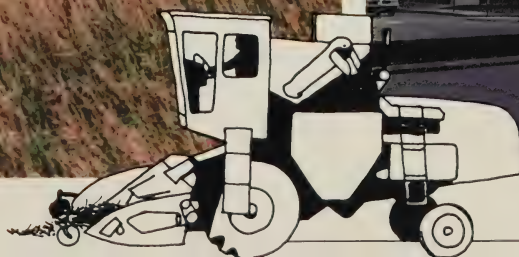
APPENDIX E

CANADIAN GRAIN COMMISSION



annual report 1977 canadian grain commission

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annual report 1977 **canadian grain commission**



**Agriculture
Canada**

Minister
Hon. Eugene Whelan

Deputy Minister
Gaetan Lussier



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CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba
February 28, 1978

The Honourable Eugene Whelan,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

The 1977 Report of the Canadian Grain Commission, in compliance with Section 14 of the Canada Grain Act, is hereby submitted.

The Commission's principal activities during the year are reviewed in the report. It contains information and statistics relating to quality and volume of grain handled through the Canadian licensed elevator system during the 1976-77 crop year. The quality of the 1977 grain crop is also reviewed.

Respectfully submitted,

H. D. Pound
Chief Commissioner

George G. Leith
Commissioner

R. H. Harland
Commissioner

R. S. Allen
Corresponding Secretary

R. A. Gosselin
Recording Secretary



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INTRODUCTION

In the interests of producers, the Canadian Grain Commission establishes and maintains standards of quality for Canadian grain and regulates grain handling in Canada to ensure a dependable commodity for domestic and export markets.

The *Inspection Division* is responsible for maintaining quality control in Canadian grain. It officially inspects all grain received into and shipped out of licensed terminal elevators and all grain shipped for export from licensed transfer elevators.

The *Weighing Division* is responsible for the official weighing of grain received at and shipped from licensed terminal elevators and supervises weighing at licensed transfer elevators. It examines and tests scales used in licensed terminal and transfer elevators.

The *Economics and Statistics Division* publishes complete data on the storage and handling of grain within the licensed elevator system, conducts economic research, licenses and supervises the bonding of elevators and grain dealers, carries out the registration of terminal and transfer elevator receipts, and provides documentation services to the industry. Under the Western Grain Stabilization Act, the Division collects the producers' levy from firms that deduct the funds on grain purchases.

The *Grain Research Laboratory* is responsible for basic and applied research on the quality of cereal grains and oilseeds. It conducts quality surveys of current crops and shipments, and tests new varieties in collaboration with plant breeders and the Commission's Inspection Division.

The *Canadian Government Elevators Division* manages, operates and maintains five inland terminals and one seaboard terminal.

Acting as representatives of the Commission, the *Assistant Commissioners* supervise the licensed primary elevators, deal with producer enquiries and complaints and attend meetings relating to the handling and quality control of grains and oilseeds. In addition, the Commission constitutes a Grain Appeal Tribunal, and Western and Eastern Grain Standards Committees.

It administers the Grain Futures Act which involves supervision of grain futures trading, and also has responsibility for setting maximum lake freight rates when considered advisable, under the provisions of the Inland Water Freight Rates Act.

SECTION 1—GRAIN PRODUCTION, QUALITY AND DISPOSITION

Grain Supplies and Disposition, 1976-77

The 1976-77 crop year saw a high level of activity similar to that of the early 1970's. Bulk exports and producer deliveries were the largest since the highs established in 1972-73.

Total stocks of wheat, oats, barley, rye, flaxseed and rapeseed carried over into the 1976-77 crop year were estimated at 573.4 million bushels. The 1976 crop included 866.7 million bushels of wheat (15.6 million metric tonnes), 313.3 millions of oats (4.8 million tonnes), 482.9 millions of barley (10.5 million tonnes), 17.3 millions of rye (439 thousand tonnes), 10.9 millions of flaxseed (277 thousand tonnes) and 36.9 millions of rapeseed (837 thousand tonnes). The August 1, 1976 carry-over, augmented by the 1976 new crop production of 1,728 million bushels (40.5 million tonnes), provided a total available supply of 2,301 million bushels (54.2 million tonnes) for export or domestic consumption.

Canadian farmers delivered a combined total of 959.2 million bushels (23.8 million tonnes) of the principal grains to the licensed elevator system during the 1976-77 crop year—second only to the 1.0 billion bushels (25.3 million tonnes) achieved in 1972-73.

Canada exported 730.1 million bushels (18.4 million tonnes) of the six principal grains during the 1976-77 crop year—9% below the record volume in the 1972-73 crop year. Compared with last year's clearances, all grains except barley and rye registered increases.

The 1976-77 disappearance included 781.4 million bushels (16.4 million tonnes) utilized in Canada for human food, feed, seed and industrial use. Combined with the exports (bulk grain and processed products) of 765.9 million bushels (19.3 million tonnes), this left a carry-over on July 31, 1977 of 754.2 million bushels (18.6 million tonnes)—183.9 million bushels (5.0 million tonnes) more than a year earlier. About 51% of the total was stored on farms.

Further details of the supply and disposition of Canadian grain are contained in Table 1 of Appendix A.

Grain Marketing and Quality—1976-77

Red Spring Wheat. Red spring wheat marketed by Western Canadian producers during 1976-77 amounted to 495.8 million bushels (13.5 million tonnes), an increase of 12.5% over the 440.6 million bushels (12.0 million tonnes) of the previous crop year. Railway carlot shipments of red spring wheat from primary country elevators into the domestic market and terminal elevators during the crop year showed a distribution between grades as follows: No. 1 Canada Western, 62.6%; No. 2 Canada Western, 21.6%; No. 3 Canada Western, 7.0%. The percentage of country elevator carlot shipments of red spring wheat which had a moisture content in the tough and damp range in the crop year was quite small at 2.5%.

Exports of Canadian red spring wheat during the crop year totalled 357.8 million bushels (9.7 million tonnes). The predominant grade exported from Atlantic ports (including Thunder Bay) during the year was No. 1 Canada Western 13.5% protein followed closely by No. 1 Canada Western 12.5% protein and successively smaller amounts of five other grades and protein levels. At the Pacific coast, the predominant grade exported was No. 1 Canada Western 12.5% protein followed in order by No. 1 Canada Western 13.5% protein, No. 2 Canada Western unsegregated as to protein, No. 3 Canada Western and five other grades and protein levels. For Atlantic cargoes, test weight was higher in 1976-77 than in the previous crop year for almost all grades. Flour yield was slightly higher for most grades and flour color was equal to or better than the levels of the previous year, but baking absorption levels were lower for all grades. Loaf volumes were about the same or slightly lower than for 1975-76 Atlantic cargo shipments. For red spring wheat exports through Pacific ports, test weight was slightly higher in 1976-77 than in the previous year. Flour color was better but baking absorption levels were lower for all grades. Loaf volumes were about the same as for the previous crop year.

Amber Durum Wheat. Amber durum wheat marketed by producers in Western Canada in the 1976-77 crop year totalled 56.2 million bushels (1.5 million tonnes), a substantial drop from the 84.8 million bushel (2.3 million tonne) level of the previous crop year. The grade distribution in the carlot movement of durum wheat in the crop year was as follows: No. 1 C.W. 6.7%, No. 2 C.W. 34.4%, No. 3 C.W. 36.1%, Extra No. 4 C.W. 8.2%, No. 4 C.W. 13.2% and No. 5 C.W. 1.0%. Kernel weight was higher for all grades. Higher semolina yields are the result of a change in laboratory milling procedures designed to reflect more closely commercial milling practice. Semolina pigment levels were higher for all grades except Extra No. 4 and No. 4 C.W. Spaghetti color was satisfactory for all grades.

Exports of amber durum wheat from Atlantic ports during the crop year (representing 78.6% of the total) were higher in test weight and kernel weight than in the previous year. Pigment levels in the semolina and the spaghetti were lower than the previous crop year but spaghetti color was satisfactory for all grades. Test weight of Pacific durum exports was about the same or slightly higher than for Atlantic shipments while kernel weight was significantly higher. Semolina and spaghetti pigment levels were also higher for the Pacific shipments; spaghetti color was better.

Barley. Barley marketed in Canada during the 1976-77 crop year totalled 269.4 million bushels (5.9 million tonnes), an increase of 25% over the level in 1975-76. Marketings during 1976-77 were higher in test weight but lower in kernel weight and in percentage of plump barley. The enzymatic activity of the barley was higher during the crop year. The proportion of the carlot movement of barley qualifying for the Canada Western grades or for malting was somewhat higher in 1976-77 with over 9% representing the six-row grades and almost 3.5% the two-row grades. The predominant grade was No. 1 Feed, accounting for just under 70% of the carlot movement, while 6.6% of the barley movement in the crop year graded tough or damp. Exports of malting barley were down slightly this year from last, and were made up of 5.1 million bushels (111 thousand tonnes) of six-row and 3.4 million bushels (74 thousand tonnes) of two-row.

Oats. Producers' marketings of oats in the 1976-77 crop year amounted to 55 million bushels (848 thousand tonnes), an increase of nearly 7% above the level in the previous crop year. The proportion of the 1976-77 carlot movement entering the grades No. 3 C.W. or higher was 24.4%, up significantly from the previous crop year.

Rye. Producers' marketings of rye in the 1976-77 crop year totalled 11.9 million bushels (3 million tonnes), a slight decrease from the level of the previous crop year. The predominant grade of rye moved forward from primary elevators during the year was 2 C.W. and represented over 67% of the movement.

Flaxseed. Flaxseed marketings during the year totalled 9.7 million bushels (247 thousand tonnes), a decrease of over one-third from that in the previous year. The predominant grade was No. 1 C.W. with an average oil content of 42.3% (dry basis), down slightly from the level of the previous crop year. Protein content of the oil-free meal from No. 1 C.W. flaxseed was also lower this year than last, averaging 40.3%.

Rapeseed. Producers' marketings of rapeseed during the crop year amounted to 44.7 million bushels (1.0 million tonnes) and represented a decrease of over 27% compared with the previous crop year. The predominant grade, No. 1 Canada Rapeseed, averaged 41.8% oil content (8.5% moisture basis) fractionally higher than the level in the previous crop year. The erucic acid content of the carlot movement averaged 3.1% and represented a significant drop from the level in the previous year. The protein content of the oil-free meal from No. 1 Canada Rapeseed averaged 35.8%, 0.1 percentage units lower this year.

Domestic Mustard Seed. Shipments of mustard seed declined from 353 carlots in 1975-76 to 206 carlots in 1976-77. Most of the carlots inspected graded No. 1 or No. 2 C.W. Yellow, Oriental or Brown Grades.

Domestic Buckwheat. Carlot inspections increased slightly during the crop year. A total of 253 carlots were inspected compared to 251 during the 1975-76 period. The predominant grade was No. 2 Canada.

Eastern White Winter Wheat. Carlots of wheat inspected totalled 113. Of that quantity, 102 qualified for No. 2 Canada Eastern White Winter grade.

Eastern Corn. The number of inspected carlots decreased from 368 carlots in 1975-76 to 109 carlots in 1976-77. The grades No. 2 and 3 C.E. Yellow accounted for 73.4% of the inspections.

Eastern Soybeans. The number of carlots inspected registered an increase from 362 in the previous year to 458 in 1976-77. About 70% of the straight grade soybeans entered into the No. 1 or No. 2 Canada Yellow grades.

Eastern Pea Beans. The 1976-77 crop saw an increase in carlot inspections to 131 from 65.

Growing Conditions, Grades and Quality, 1977 Crop

The 1977 growing season was a season of extremes.

While the moderate winter allowed producers to get an early start on seeding, most areas suffered from a lack of moisture during the seeding period because of a lack of rain in the fall of 1976 and a very light snow cover during the winter. Drought conditions in southern Alberta and Saskatchewan resulted in some soil erosion.

Growing conditions improved somewhat because of rains that fell in the month of May. But the latter part of June was unusually dry and most areas again suffered from a lack of moisture. During July, the crops in the southern Prairie regions continued to suffer from lack of moisture while central and northern areas were cool, particularly in the Peace River area.

The swathing of rye and barley was general in southern areas by the end of July with some combining in Saskatchewan and Alberta. However, in the central and northern areas, crop maturity was slowed by cool and wet weather that caused a gradual deterioration of swathed grain.

Seventy percent of the 1977 crop was swathed by the end of August but only 30% had been combined. Harvesting progress was hampered by continued cool, wet weather. Precipitation in all regions of the Prairies continued during the early part of September causing considerable deterioration in the quality of grain in the swath and lodging of standing grain.

Warmer, drier weather did not come to most of the Prairies until late September or early October and then conditions remained favourable until the end of October. Much of the cereal crop which stayed in the fields during the wet period was damaged by the inclement weather. A considerable portion of the harvested grain required drying.

Red Spring Wheat. Statistics Canada estimates (as at Nov. 15, 1977) that the 1977 Prairie production of spring wheat will be 638.1 million bushels (17.4 million tonnes), a decrease from the figure of 731 million bushels (19.9 million tonnes) in 1976. The carry-over from previous crops was estimated as at July 31, 1977 to be 408 million bushels (11.1 million tonnes). The Commission estimates that 21% will qualify for the No. 1 C.W.R.S. grade, 22% for No. 2 C.W.R.S., 37% for No. 3 C.W.R.S. The balance will enter the Canada Utility grades, with 16% qualifying for No. 3 C.U.

The average protein content of the 1977 crop is estimated to be 13.1%, above the figure of 12.8% for 1976 and 0.6% below the average level of 13.7% for the 20-year period from 1957 to 1976. Alberta-produced wheat has the highest average protein content with a figure of 13.3%, followed by Saskatchewan at 13.1% and Manitoba at 12.7%. The protein content of No. 3 C.W.R.S., the predominant grade, is 12.6% for Manitoba, 12.4% for Saskatchewan and 12.8% for Alberta. The protein content of the top three grades was as follows: 13.5% for 1 C.W., 13.0% for 2 C.W. and 12.6% for 3 C.W.

Amber Durum Wheat. Statistics Canada estimated at November 15, 1977 that the Prairie production of amber durum wheat would be 46.9 million bushels (1.3 million tonnes), down from 105 million bushels (2.9 million tonnes) in 1976. The Commission estimates that 24% will enter in the No. 1 C.W.A.D. grade, 37% in No. 2 C.W.A.D., 21% in No. 3 C.W.A.D., 11% in No. 4 C.W.A.D. and 6% in No. 5 C.W.A.D.

The average protein content of the 1977 crop is estimated to be 13.4%, up from the figure of 12.9% for 1976. The hectolitre weight and 1000-kernel weight of all grades is good. The gluten quality of the crop as assessed by the farinogram is similar to that of 1976. The semolina and spaghetti pigment level are lower than those of the previous year while spaghetti color of the new crop is satisfactory.

Barley. According to Statistics Canada (as at Nov. 15, 1977), the 1977 Prairie production of barley has increased to 502 million bushels (10.9 million tonnes) from 455 million bushels (9.9 million tonnes) for 1976. The Commission estimates that 45% will grade No. 1 Feed. Despite adverse harvesting conditions, early harvested barley was sound and of good quality. The protein content of the crop was 0.5 to 1% higher in 1977 compared to 1976 and enzymatic activity was also higher.

Flaxseed. It has been estimated that 24 million bushels (610 thousand tonnes) were produced in the Prairies in 1977, up from 10.9 million bushels (277 thousand tonnes) in 1976. Only 46% will grade No. 1 C.W., with 28% in the No. 2 C.W. grade and 18% in No. 3 C.W. The protein content of the oil-free flaxseed meal is 40.4%, 0.7% lower than last year. The average oil content of the new crop is 44.3%, as compared to 43.0% for last year. The iodine value of the oil is 196 units; the iodine value of the oil in 1976 was 192.

Rapeseed. The 1977 Prairie production of rapeseed was estimated by Statistics Canada (as at Nov. 15, 1977) to be 76.9 million bushels (1.7 million tonnes), a substantial increase from 36.4 million bushels (826 thousand tonnes) for 1976. About 63% will enter into the No. 1 Canada Rapeseed grade, 24% in No. 2 Canada Rapeseed and 8% in No. 3 Canada Rapeseed. The rapeseed oil erucic acid content fell to 1.6% from 2.3% for 1976 while the average oil content of the new crop is 41.9% (8.5% moisture basis), up from 41.3% for 1976. The rapeseed meal protein content averages 36.4%, the same figure as for 1976.

Eastern White Winter Wheat. The 1977 Ontario production of white winter wheat is estimated to be 30.2 million bushels (823 thousand tonnes), up from 24.6 million bushels (670 thousand tonnes) in 1976. The average protein content of the 1977 crop is estimated to be 10.3%, up from the 9.7% average for the previous year. The average protein content of No. 2 C.E., the predominant grade, is 10.3%.

Eastern Canadian Soybeans. Eastern Canadian soybeans production is estimated to be 19 million bushels (517 thousand tonnes) for 1977, a substantial increase from the figure of 9.2 million bushels (250 thousand tonnes) for 1976. It is expected that the predominant grades will be No. 1 and No. 2 Canada Yellow.

Eastern Corn. Eastern production of corn for grain is expected to be 167.8 million bushels (4.3 million tonnes), a substantial increase over the production of 147.3 million bushels (3.7 million tonnes) for the previous year. The predominant grades are expected to be No. 1 and No. 2 C.E. Yellow.

Eastern Pea Beans. The quantities of Eastern pea beans produced in 1977 has decreased substantially from 1976; while 1,818,000 hundredweight (82,500 tonnes) were grown in 1976, it is estimated that the figure for 1977 will be 880,000 hundredweight (39,900 tonnes). The quality of the crop was adversely affected by wet weather during harvest; the predominant grades are expected to be No. 3 and No. 4 Canada Eastern.

SECTION 2—OPERATIONS

Licensing and Related Activities

Licensing. The total number of licences for all elevator categories issued by the Commission as at August 1, 1977 declined by 5.6% to 3,821 from 4,049 a year earlier. Grain dealer licences totalled 30 compared to 29 for the previous year. Total licensed storage capacity declined by 19,470,560 bushels (546,310 tonnes) or 3.1%, to 606,156,400 bushels (16,973,630 tonnes) from 625,626,960 bushels (17,518,940 tonnes). A reduction in capacity of 11.2 million bushels (313,270 tonnes) occurred in the primary elevator system, while terminal elevator capacity dropped 8.8 million bushels (246,980 tonnes) and transfer storage increased 0.5 million bushels (14,000 tonnes) as compared to the previous year.

Bonding. During the 1976-77 crop year, guarantee bonds executed by 21 surety companies were deposited with the Commission as security by the licensees.

Insurance. Terminal, transfer and primary elevator licensees maintained adequate insurance on grain stocks in their licensed premises. Insurance policies were filed with the Economics and Statistics Division; the Division verified the adequacy of this coverage by comparing them with the regular stock reports submitted by licensees.

Documentation

Statistics. The Economics and Statistics Division is the principal source of Canadian grain storage and handling statistics. Prescribed records and periodic reports of stocks and handlings of grain are submitted by licensees. These are an important part of the Commission's control and supervision of the elevator system. Corresponding data from other Divisions of the Commission, from the Canadian Wheat Board, and from other organizations and associations within the grain trade are also received by the Economics and Statistics Division. On the basis of this information, the Division compiles and publishes comprehensive bulletins on the storage and handling of Canadian grain within the Canadian elevator system and its movement to domestic and export markets. The reports are distributed throughout Canada and to overseas correspondents and also serve as a basis for supervisory and regulatory activities of the Commission and related agencies.

The Division works closely with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, the Canada Grains Council, and other federal and provincial government offices. On a correspondent basis, it exchanged data and provided statistical assistance internationally with the Commonwealth Economics Committee, the Food and Agriculture Organization of the United Nations, the International Wheat Council, and the United States Department of Agriculture.

During the year, the Economics and Statistics Division began investigating

the possibilities of summarizing the data collected for the Western Grain Stabilization Administration for statistical information purposes. The publication of a statistical series on prices derived from this data was commenced.

Appendix A lists statistics pertaining to the 1976-77 crop year. A list of the principal statistical releases is included in Appendix C.

Documentation Services. A documentation and reporting service on the inward and outward grain movement at licensed terminal elevators is provided by the Economics and Statistics Division. Basic information from the reports of the Inspection and Weighing Divisions is extracted to produce certificates of Canadian grain, terminal receipts and terminal elevator outturns for distribution within the industry. Information is distributed to elevator companies, railways and the Canadian Wheat Board by a telecommunications network. The data is an essential element of the accounting systems of these organizations. The information is also used to prepare most of the statistics published by the Division.

Registration. Operators of terminal and transfer elevators are required to issue elevator receipts for all grain taken into store. Such elevator receipts must be registered with the Commission and following registration, become negotiable documents to be used as collateral by the grain companies in financing the movement of grain. Through the offices of the Economics and Statistics Division in Winnipeg, Vancouver, and Montreal, the Commission maintains a control over this registration and the subsequent cancellation of these documents following shipments.

Primary Elevators

Tariff of Charges. Maximum charges for elevation at licensed primary elevators were revised, effective August 1, 1977, to reflect increases in costs of elevator operation. The maximum rate for wheat was increased from 13½¢ to 14¾¢ per bushel, oats from 12½¢ to 13½¢, barley from 13½¢ to 14¾¢, flaxseed from 15¢ to 15¾¢, and for rapeseed from 13¾¢ to 14½¢ per bushel. No changes were made in rates for other primary elevator services.

Inspection of Elevators. Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Calgary keep the Commission in touch with the operations of licensed primary elevators across the Prairies. In the Eastern Division, the Assistant Commissioner is located at Harrow, Ontario.

They inspected a total of 2,678 primary elevators during the 1976-77 crop year; this figure includes 491 elevators in Manitoba, 1,600 in Saskatchewan and 587 in Alberta.

The investigation of producers' complaints and of reported infractions of Commission regulations and orders is an important part of the Assistant Commissioners' responsibilities. They also deal with enquiries on matters relating to grain handling, conduct special investigations, participate in different surveys and projects and publicize the Commission and its activities.

Grading Services to Producers. During the 1976-77 crop year, the Grain Inspection Division inspected 48,538 "Subject to Inspector's Grade and

Dockage" and other unofficial samples submitted by producers and the grain trade, including 39,455 western grain samples and 9,083 eastern grain samples. Although the 1976 crop was of above average quality, sample submissions were slightly higher than in the previous crop year.

Producer complaints against special bin carlot shipments from primary elevators totalled 18. The Chief Grain Inspector established that identity had not been preserved by the primary elevator in six cases.

Weigh-overs. The following table summarizes results of primary elevator weigh-overs conducted by licensed grain handling companies during the 1976-77 crop year. The Commission reviewed the details of the weigh-overs and other related records and, when necessary, held discussions with company management. The Assistant Commissioners are given authority to deal directly with elevator managers and superintendents where overages or shortages have been reported in excess of acceptable tolerances.

Elevators reporting	1976-77	1975-76
Shortages	251	379
Neither overages nor shortages	40	46
Overages of less than .25%	395	572
Overages of .25% to .50%	204	271
Overages over .50%	86	122
Total number of elevators weighed over	976	1,390

Terminal, Process and Transfer Elevators

Tariffs of Charges. Effective August 1, 1977 the maximum charge for storage of grain at licensed terminal elevators was increased from 1/30¢ to 1/20¢ per bushel per day for the principal cereal grains and oilseeds. Also, several items in the maximum tariff for transfer elevators were revised following review of submissions from elevator operators. The increased rates were granted by the Commission to compensate for inflationary increases in costs of operating the elevators. However, the maximum storage rate for transfer elevators was left unchanged at 1/20¢ per bushel per day.

Inspection of Equipment. The Weighing Division carried out 698 routine and special inspections of 410 scales in licensed terminal and transfer elevators to ensure the continued accuracy of the scales.

The plans and specifications of seven new projects for construction or alteration of elevator facilities were examined by the Commission to verify their acceptability for licensing. Upon completion, they were again inspected by the Commission's representatives.

Inspection and Weighing Services. All grain received at and shipped from licensed terminal elevators in the Western Division is sampled and graded by Inspection Division staff. Personnel of the Weighing Division also supervise weighing of grain at those facilities. Similar services are also provided at some

licensed process elevators of the Western Division. The Inspection Division sampled, inspected and certified grain loaded onto vessels for export by licensed transfer elevators at St. Lawrence River and Maritime ports. Services at Lake ports in the Eastern Division, such as sampling, inspection and weighing, were provided on request. A considerable volume of eastern grown grain was sampled and graded by the Chatham, Ontario inspection office for the local grain trade.

Information on the quantity of grain inspected and weighed during the 1976-77 crop year is given in Appendix A.

New Equipment. Automatic electronic scales were installed by licensees to replace 18 manually operated mechanical scales. A total of 94 licensed terminal and transfer elevator scales were converted to the metric system of measurement. Such newly installed equipment is subject to thorough testing by weighing systems inspectors of the Weighing Division.

Construction of an operational laboratory in Winnipeg to house the Automated Digital Analyzer was completed. It will allow greater output to facilitate the Commission's wheat protein segregation system. One computer unit was added to the laboratory, doubling the laboratory's potential output. A protein testing control laboratory was also completed at Thunder Bay, Ontario, to monitor the performance of protein testing facilities in that port's terminal elevators.

Pneumatic sample transport systems were installed to facilitate Inspection Division services at four terminal elevators.

The Inspection Division program to provide a uniform lighting system for grading was completed and all inspection offices are now equipped with adequate artificial light fixtures.

Some scales and balances used by inspectors for the analyses of grain samples were converted to metric measure. Equipment to measure test weight, temperature and moisture was purchased in preparation for the industry's conversion to the metric system of measurement.

Grain Drying. Excellent weather conditions prevailed throughout the 1976 harvest period. This accounted for the fact that only about 14 million bushels of high moisture grain were artificially dried by terminal elevators under the supervision of the Commission's Inspection Division. This was substantially less than the 83.4 million bushels artificially dried by terminal elevators during the 1975-76 crop year.

Weigh-overs. The Commission periodically conducts audits to determine whether grain handling operations at terminal and transfer houses have resulted in excessive overages or shortages. They also serve to confirm the validity of commercial documents covering stored grain. The Economics and Statistics Division prepares summaries of weigh-over results for review by the Commission. During the 1976-77 crop year, 13 licensed terminal elevators and 8 licensed transfer elevators were audited by the Weighing and Inspection Divisions.

Canadian Government Elevators

The Canadian Grain Commission manages and operates five inland terminals and one seaboard terminal. These comprise the Canadian Government Elevators system.

Handlings. Total receipts of grain during the 1976-77 crop year of 30.2 million bushels represented a decline in handlings for the second successive year. The total remains close to the 10-year average of about 30 million bushels. Shipments of grain from the facilities stood at 32.9 million bushels.

The decline in handlings at interior terminals reflects the discontinuance of the Canadian Wheat Board trucking experiment which had been operational for several years and which had generated a substantial flow of grain from primary elevators to interior terminals. The lower quantity of grain originated from the northern regions of the Prairies, the area which normally ships grain to Prince Rupert, accounted to some extent, for that elevator's decline in handlings.

Elevators at Saskatoon, Edmonton and Calgary are now recognized as grain futures delivery points for rapeseed by the Winnipeg Commodity Exchange; this accounts, in some measure, for the increased movement of rapeseed through the elevators. In addition, all interior facilities have local arrangements with producers, grain companies, grain dealers and processors to handle Board and non-Board deliveries of grain as well as special crops such as mustard, buckwheat, corn and contract crops. The new car dumper at Prince Rupert enabled that terminal to handle wheat bran pellets for the export market.

Approximately 50% of grain handled was wheat, the balance consisting of oats, barley, rapeseed, flax, rye, corn and special crops. Receipts and shipments at individual terminals were as follows:

ELEVATOR	Storage Capacity	Stocks August 1,	Receipts	Shipments	Stocks July 31,
		1976			1977
—thousands of bushels—					
Moose Jaw	5,500	193	458	533	118
Saskatoon	5,500	2,180	5,378	6,965	593
Calgary	2,500	1,456	2,757	3,292	921
Edmonton	2,350	1,096	3,437	4,461	72
Lethbridge	1,250	271	1,803	1,891	183
Prince Rupert	2,250	851	16,390	15,799	1,442
Totals	19,350	6,047	30,223	32,941	3,329

Facilities & Equipment. At the Prince Rupert elevator, the newly installed air pollution control equipment became operational in November, 1976. A major relocation of trackage commenced which will enable the storing of 85 cars on the outrun side of the elevator; the second phase of that program will provide a similar amount of storage on the inward side.

A major program of electrical and mechanical rehabilitation was completed at Calgary and all electrical equipment brought up to required standards. Similar programs have been initiated and are currently under way at

Saskatoon and Lethbridge, with Moose Jaw the only elevator within the system yet to undergo a similar renovation.

The automation of scales was completed at Edmonton and a similar program is under way at Calgary.

Two trackmobiles were purchased to aid in the spotting and moving of cars at the Prince Rupert elevator. At Saskatoon, structural repairs to the grain drier building were completed and a major program of structural repairs was initiated for the elevator proper.

Quality Control Activities

Meetings of Grain Standards Committees. The Western Grain Standards Committee met in Winnipeg on November 8 and 9, 1977. Proposed changes to the grade schedules and export standard specifications of red spring wheat, utility wheat, amber durum wheat, barley, oats, flax, and western beans were discussed. Various proposals were recommended for approval while others were referred to the members for their review. The report of the Committee Reviewing Grades of Barley was also discussed and referred to the members. The quality of the 1977 crop was considered at some length, especially as it relates to the increased quantities of the grade No. 3 Canada Utility. While the proposal for splitting of the 3 C.U. grade into separate grades was rejected by the Committee, it did recommend for approval a tentative export standard for the grade. The members also recommended the establishment of 35 samples as primary standards and 10 samples as export standards for the 1977-78 crop year.

Two meetings were held by the Eastern Grain Standards Committee. At the meeting in Toronto, Ontario, on September 1, 1977, 10 samples were recommended as standard samples for winter wheat, barley, oats and rye by the Committee. Revisions to the pea bean schedule were dealt with as were changes to the grade specifications for flaxseed, barley and rye. During the meeting held in Montreal, Quebec, on October 27, 1977, the Committee recommended 12 samples as standards for pea beans, soybeans and corn.

Appendix B of the report lists Committee membership as constituted pursuant to Section 17 of the Canada Grain Act.

Grain Appeal Tribunal. During the crop year 1976-77 a total of 224 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg. These pertained to the unload grades of carlots and truck lots officially inspected in the Western Division. The grades assigned by the Grain Inspection Division were sustained in 201 cases. Most of the samples reviewed by the Tribunal represented shipments of either barley or wheat and covered a wide range of varieties and grades.

Variety Testing. The Grain Research Laboratory collaborates each year in the annual quality evaluation of plant breeders' cultivars of red spring and amber durum wheats, and malting barleys grown in the Co-operative Tests. Detailed quality tests were carried out early in 1977 on 40 cultivars of red spring wheat, 60 cultivars of amber durum wheat and 108 cultivars of barley. In addition, a collaborative study of the quality of five Canadian bread wheat cultivars was carried out. Twenty-two collaborators from five different countries par-

ticipated in the evaluation of the quality of some of the most advanced red spring wheat lines from the Co-operative Test.

The Inspection Division examined and reported on the visual characteristics of thirty-five hundred samples of barley and wheat that were received from plant breeders. A total of 84 varieties of spring and winter barley and 56 varieties of wheat grown in 1976 eastern and western co-operative variety tests were submitted to the Division.

Protein Segregation of Wheat. During the 1976-77 crop year, the Commission maintained its program of protein segregation of red spring wheat at licensed terminal elevators.

Cargo shipments consistently satisfied export protein requirements and no formal complaints relating to guaranteed protein levels were received from overseas buyers.

A program of on-the-spot protein determinations in terminal elevators was implemented and the primary elevator sample system was terminated.

The Commission continued its program of testing electronic protein determination equipment for use at terminal elevators. The testing of two types of single-celled devices, using the principle of infrared spectroscopy, were completed.

The Commission co-operated with the Canadian Wheat Board in the design and administration in an experimental program to permit producers to ship selected carlots of high protein wheat for market development purposes.

The Commission participated with licensees in an experimental program involving the collection of representative samples of all deliveries of 1 and 2 C.W. wheat by producers to six primary elevators during February to July, 1977. The Commission tested these samples for protein content. The data provided valuable information concerning the variability of protein content at a particular elevator and within an individual producer's deliveries.

Entomology Services. Insect infestations decreased at all Prairie locations as compared to the previous year. Dry conditions throughout the grain growing areas of the Prairies resulted in the harvesting of a dry crop and provided ideal storage conditions. However, rainfall on swathed grain in several areas of southern Alberta caused some infestations of grain during late fall and winter. Increased demand for amber durum wheat brought some old stocks out of storage, with consequent receivals of infested grain at terminals.

Conditions varied across Canada. On the West Coast, a mild winter in combination with high humidity gave rise to a sharp increase in moth populations in and around terminal facilities. Dry conditions on the Prairies were reflected in the decreased cases of infestation at Thunder Bay terminals. Southern Ontario, despite its mild climate, experienced fewer cases of infested cereal grains.

The Commission's Entomology Section processed over 66,000 samples during the 1976-77 crop year. The Rusty Grain Beetle was the most frequently discovered insect. There were, as well, occasional interceptions of the Granary Weevil and the Saw-Toothed Grain Beetle at primary elevators.

The Commission's program of random checks on carlots arriving at Thunder Bay and Vancouver continued during the crop year. Over 9,000 carlots were sampled and infested carlots represented less than 0.09% of the total cars received. The Commission's control program for identification of

infestation problems was also continued during the period. In some cases, shipments from infested primary facilities were suspended. Fumigation of stocks was required before shipments were resumed.

The Commission's extension program on the detection and control of insect infestations included meetings with primary elevator managers and terminal operators. In addition, the Commission participated in the creation of the Committee on Insect Infestation of Western Grain. The Committee, comprised of representatives from the Provincial Departments of Agriculture in the Prairie provinces, the Canada Department of Agriculture and the Country Elevators Association will establish a program of grain sanitation and insect control for the grain industry.

Monitoring Moisture Meter Performance. The Research Laboratory maintains a bi-weekly check test program to monitor the performance of all model 919 moisture meters used by the Grain Inspection Division and by the Government Elevators Division in their offices across Canada. As required, meters are serviced and repaired in the Research Laboratory.

Pesticide Residue Monitoring. The Research Laboratory's continuing program to monitor Canadian exports of wheat, barley, oats and rye for residues of organochlorine and thiophosphate pesticide chemicals involved analyses of 1,804 cargo samples during the 1976-77 crop year. A random selection of cargoes was also monitored for phosphine.

Rapeseed Monitoring. Both the domestic railway carlot and cargo export movement of rapeseed is monitored by the Research Laboratory to obtain data on oil content, erucic acid content and chlorophyll or "green color" in the seed. Quality data for cargoes are supplied monthly to the oilseed industry.

Special Acts Administration

Grain Futures Act. The supervisor of grain futures trading regularly visited the trading floor of the Winnipeg Commodity Exchange to observe procedures used by the members. Similar visits were made on an occasional basis to the Vancouver Grain Exchange. Books and records of the clearing house were examined, from time to time, to ensure that transactions in grain futures were being handled and recorded in a manner acceptable to the Commission.

Section 2 of the Act was amended on June 29, 1977 by repealing the definition of the word "grain" and substituting the following revised definition: "grain" means "grain" as defined in subsection 2 (16) of the Canada Grain Act. Prior to the amendment, the provisions of the Act applied only to wheat, oats, barley, rye, flaxseed and corn; and other grains such as rapeseed were excluded.

In August, 1977 the Commission engaged the services of Mr. Charles Kroft and Mr. W. Scott Neal as consultants to carry out a study and submit a report and recommendations relating to the futures market in Canada and its regulation, with particular emphasis on the Grain Futures Act. After a detailed examination of the contents of this report, the Commission will prepare a recommendation as to the advisability of revising or re-writing the Grain Futures Act which was passed by Parliament in 1939.

Western Grain Stabilization Act. Under the Western Grain Stabilization Act, which became effective April 1, 1976, the Canadian Grain Commission is responsible for the collection of the 2% levy paid by participating producers and of the information on the sales of the major grains by all producers.

The Economics and Statistics Division collects this levy and sales information from all licensees in the designated area and from the majority of those firms not licensed under the Canadian Grain Act which purchase grain from farmers. The funds collected by the Division are immediately forwarded to the Western Grain Stabilization Administration.

Inland Water Freight Rates Act. The Commission did not find it necessary to establish any maximum freight rates under the provisions of this statute.

Complaints and Inquiries

Producers' Complaints. Written complaints concerning transactions between producers and primary elevator operators were investigated by the Commission and the Assistant Commissioners. In the majority of cases, settlements satisfactory to both parties were arranged. In addition, a wide variety of informal complaints were investigated by the Assistant Commissioners. If and when necessary, they advised elevator managers and company superintendents concerning the resolution of specific problems of individual producers.

Cargo Shortages. The Weighing Division investigated the loading of cargoes and all available information on the unloading at destination whenever excessive shortages were indicated on vessel shipments from licensed terminal and transfer elevators.

Quality of Export Shipments. Investigations were carried out by the Inspection Division or the Grain Research Laboratory whenever inquiries were received relating to the quality of grain exported overseas. Official loading samples of the shipments were studied and tested. Affected parties were provided with detailed reports.

SECTION 3—RESEARCH AND INFORMATION

Research

Laboratory Research. The Grain Research Laboratory pursued its program of basic and applied research on the quality of cereal grains and oil-seeds.

The study of enzyme systems in grain was the major thrust of a number of projects. An affinity chromatography procedure (technique used to separate chemical constituents) was used to separate and partially purify enzymes which can break down the protein constituents of wheat. Changes in enzyme activity during germination have been followed in red spring and amber durum wheats. Endo-proteolytic activity appears mainly responsible for the increases in activity which occur during germination. Studies on the effects of activators and inhibitors indicate that protein hydrolysis (breakdown) in wheat during germination is controlled by endo-proteolytic enzymes that are produced for the first time during hydrolysis; their production is governed by hormones. Another type of proteolytic enzyme (carboxypeptidases) present in ungerminated endosperm appear to act together with endo-proteolytic enzymes, resulting in a rapid breakdown of storage (gluten) proteins to their constituent amino acids.

A starch debranching enzyme and the enzyme system (superoxide dismutase) involved in oxidation and reduction processes of the plant were examined during growth, maturation and germination of wheat. The debranching enzymes also appear to develop in the endosperm of wheat kernels and their activity increases during germination. The latter enzyme increases throughout kernel development and during germination and is located in the green layer, endosperm and aleurone tissues of the developing kernel.

Several instruments were designed and constructed for specific research purposes. These included a portable freezing chamber for a field study of the effect of frost damage on maturing wheat; an instrument for measuring motor reaction torque, power and energy during grinding for a stand of pilot mill break rolls, and a novel device for monitoring changes in dough consistency during mixing in a Tweedy-35 dough mixer.

Special baking studies included development of a laboratory baking test for evaluating flours for the production of Brazilian "Pao Frances" bread rolls; and successful simulation using a short process, for "Cream Bread", as prepared in the Philippines, normally made by a method involving several hours fermentation.

The laboratory's method of carrying out the Chopin Alveograph assessment of some aspects of dough quality has been modified after an extensive study and is now identical with the International Association for Cereal Chemistry standard method No. 121.

Work on high extraction flour milling has continued with particular emphasis on the effect of milling method and extraction level on flour strength and baking performance for wheats of different basic quality.

In a joint project with the Department of Plant Science, University of Manitoba, a scanning electron microscope was used to study the structure of pasta dough, cooked pasta and gluten. Research into the relation between

gluten protein properties and pasta dough's rheology (study of deformation and flow characteristics) in the farinograph dough mixer is continuing.

Emphasis in the area of barley research was placed on the evaluation of methods to predict and determine malting quality. Areas investigated were as follows: measurement of barley viscosity as a crude measurement of barley betaglucan content; determination of the total polyphenol content of barley, malt and beer as a potential method for determining the bitterness of beer; and finally, replacement of the standard method for measuring malt extract with a method of measuring specific gravity.

Research on barley also involved several studies of alpha-amylase enzymes. A simple procedure involving the lowering of the acidity of alpha-amylase from malted barley permits differentiation between two forms of the alpha-amylase enzymes. During germination of three barley cultivars, Conquest, Betzes and Klages, three main groups are produced; the groups are different for each cultivar.

Oilseeds research has resulted in an improved rapid procedure for estimating free fatty acids in rapeseed. Determination of glucosinolates in rapeseed is being investigated. A field study showed that high seeding rates appear to yield more rapid and even maturity and a lower proportion of green seed, i.e., a lower chlorophyll content. A rapid instrumental procedure has been developed to evaluate the color of rapeseed oil, rapeseed meal and mustard flour with results expressed in internationally accepted units.

The pesticide residue section developed an analytical method for the determination of phosphine in wheat with a limit of detection as low as 0.002 parts per million.

Further information on Commission research activities is printed in the annual report published by the Grain Research Laboratory.

Statistical and Economic Studies. The Economics and Statistics Division continued its regular program of studies of grain handling costs. These keep the Commission informed on the adequacy of current levels of handling and storage tariffs. In co-operation with elevator companies, the Division commenced a detailed study of the costs of cleaning grain at primary and terminal elevators.

The Division participated with the Canadian Wheat Board and elevator licensees in a number of statistical and economic research projects examining the advantages and disadvantages of extending the identification and segregation of wheat by protein content to primary elevators. Emphasis was placed on preliminary assessments of alternate protein identification systems or configurations for primary elevators from the viewpoint of technical efficiency and overall costs. Quantitative assessments of the potential benefits of protein segregation in the country have been developed as well as a preliminary analysis of the costs and risks to the present export program for wheat of guaranteed protein content. The Division is represented on a sub-committee of the Canadian Wheat Board's Grain Transportation Technical Group which began studying this subject during the crop year.

Information Program

Publications. Statistics on the movement and storage of grain within the licensed elevator system and on exports of Canadian grain to various destina-

tions are published at regular intervals by the Economics and Statistics Division.

Following the 1977 harvest the Research Laboratory published and distributed the 1977 protein maps and crop bulletins on the Western Canada crops of red spring wheat, amber durum wheat, barley, flaxseed and rapeseed. Information on the crops of Eastern white winter wheat and Eastern soybeans was distributed to the trade. Quarterly bulletins detailing the quality of export shipments of red spring wheat and amber durum wheat were also published. The Laboratory also published a separate annual report describing its scientific and technical activities.

During the 1976-77 crop year, members of the staff of the Grain Research Laboratory published a total of 20 scientific and technical papers in ten different scientific and technical journals.

Appendix C of the report lists all publications issued by the Commission.

Meetings. Commissioners and senior officials addressed a number of annual meetings of producer organizations to discuss subjects of current interest related to the Commission's activities and responsibilities. They also attended a number of other meetings of organizations interested in the storage, transportation and marketing of grain.

In addition, regular annual meetings of the Western and Eastern Grain Standards Committees were convened by the Commission.

Professional and technical staff of the Grain Research Laboratory represented the Commission at eleven scientific and technical conferences in North America, and two in overseas countries.

Overseas Visits. The Commission and its officials visited China, Australia, Japan, India, Bangladesh, the United Kingdom, the Philippines, Hong Kong, the United States, Algeria and Europe.

They met with government personnel, scientists, research staff, importers, millers and processors to discuss matters relating to the quality of Canadian grain and oilseeds. They provided detailed information on the 1976 and 1977 crops and discussed matters such as grain inspection and certification, research, marketing, transportation and storage.

Tours of Commission Facilities. Commission facilities were toured by individuals, groups, officials or missions from Japan, the United States, Sweden, Norway, China, Nigeria, France, Bangladesh, the United Kingdom, Australia, Cuba and Germany. Tours were also scheduled for participants of the international courses offered by the Canadian International Grains Institute.

Tours were also provided for Canadian producers, grain company employees, processors of grain, students, journalists, trade commissioners, commercial secretaries and scientists.

Canadian International Grains Institute. Commission staff served as resource personnel for the Institute in its courses both in Canada and overseas. Commission facilities were made available for tours and demonstrations as a regular part of the Institute's program. Two senior representatives of the Commission served as members of the Institute's Board of Directors.

SECTION 4—ADMINISTRATION

Personnel. Personnel services relating to Canadian Grain Commission staff were provided by the Personnel Administration Branch of Agriculture Canada.

Commissioner C. L. Shuttleworth retired from the Commission in September, 1977, and Mr. R. H. Harland was appointed a member of the Commission to fill the vacancy, effective September 29, 1977.

Mr. V. Duke, formerly a Deputy Director, was appointed Director of the Grain Inspection Division, effective March 1, 1977.

Mr. J. F. Mants was appointed General Manager of the Canadian Government Elevators on January 1, 1977.

Revenue and Expenditure. For the 1976-77 financial year ending March 31, 1977, Commission expenditures totalled \$27,366,000 while revenues stood at \$15,725,000. The figure for expenditures registered an increase of \$917,000 or 3.5% over the fiscal year 1975-76. Total revenues generated by the Commission declined by \$1,238,000 or 7% as compared to the previous year.

In the expenditure area, operating and maintenance costs totalled \$23,780,000, an increase of 7% or \$1,543,000. This increase was due mostly to increased personnel costs, accommodation settlements and material and supply costs. Capital expenditures declined by \$626,000 or 15% to \$3,587,000. This decrease resulted from the partial completion of Canadian Government Elevators projects such as pollution control equipment installation.

The reduction in revenues collected by the Commission stemmed chiefly from the lower grain movement, both domestically and for export. Fewer revenues were generated by the Canadian Government Elevators for both storage and handling and the Inspection Division's returns for services were down by 1.9%.

APPENDIX A

Grain Statistics and Quality

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A-1—Supply and Disposition of Canadian Grains, Crop Year 1976-77*

	Wheat**	Oats	Barley	Rye	Flaxseed	Rapeseed	Totals
—thousands of bushels—							
SUPPLY							
Carry-over July 31, 1976*** ...	293,186	79,825	126,929	12,285	14,985	46,237	573,447
Production in 1976	866,672	313,268	482,866	17,340	10,900	36,900	1,727,946
Imports	—	—	—	—	—	—	—
Total Supply	1,159,858	393,093	609,795	29,625	25,885	83,137	2,301,393
DISPOSITION							
Exports****	494,053	31,873	174,480	6,602	14,026	44,880	765,914
Domestic Use	176,449	275,114	287,499	9,356	3,518	29,473	781,409
Total Disposition	670,502	306,987	461,979	15,958	17,544	74,353	1,547,323
CARRY-OVER (July 31, 1977)							
On Farms (Estimated)	263,000	67,000	52,000	2,300	1,000	1,100	386,400
In primary, process and terminal elevators	130,571	15,275	83,507	10,391	6,685	7,121	253,550
In store and afloat to eastern transfer elevators ...	70,216	1,614	5,363	304	152	—	77,649
In eastern and western mill bins	5,610	520	4	1	—	—	6,135
In transit by rail, eastern and western divisions	19,959	1,697	6,942	671	504	563	30,336
In store and in transit to the United States	—	—	—	—	—	—	—
Total in store July 31, 1977	489,356	86,106	147,816	13,667	8,341	8,784	754,070

* Subject to Revision
** Wheat includes Durum Wheat
*** Revised
**** Includes exports of bulk grain, seeds, and (except for flaxseed and rapeseed) milled and processed products expressed as grain equivalent.

A-2—Licences in Force and Storage Capacity, August 1, 1976 and 1977

Type of Licence	Licences in force		Licensed storage capacity	
	1977	August 1 1976	1977	August 1 1976
—bushels—				
Primary Elevator	3,739	3,964	332,709,600	343,894,700
Terminal and Process Elevator	55	59	151,117,500	159,902,960
Transfer Elevator	27	26	122,329,300	121,829,300
Grain Dealer*	30	29	—	—
Totals	3,851	4,078	606,156,400	625,626,960

* These licences do not cover grain storage facilities.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1976-77

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Canada Western Red Spring	125,889	62.1	—
Tough 1 Canada Western Red Spring	82	.05	—
2 Canada Western Red Spring	43,542	21.5	—
Tough 2 Canada Western Red Spring	1,688	.8	—
3 Canada Western Red Spring	14,010	6.9	—
Tough 3 Canada Western Red Spring	3,306	1.6	—
1 Canada Utility	9,142	4.5	—
2 Canada Utility	600	.3	—
3 Canada Utility	2,898	1.4	—
Tough Others	1,526	.8	—
Damp	29	.02	—
Rejected	58	.03	—
Others red spring	—	—	—
Total red spring wheat	202,770	100.0	86.5
1 Canada Western Amber Durum	1,811	6.7	—
2 Canada Western Amber Durum	9,302	34.2	—
3 Canada Western Amber Durum	9,744	35.8	—
Extra 4 Canada Western Amber Durum	2,223	8.1	—
4 Canada Western Amber Durum	3,556	13.1	—
5 Canada Western Amber Durum	266	1.0	—
Tough durum	116	.4	—
Others durum	196	.7	—
Total amber durum wheat	27,214	100.0	11.6
Total soft white spring	1,555	34.7	.7
Total mixed wheat	—	—	—
Total Alberta winter wheat	2,931	65.3	1.2
Total all wheats	234,470	100.0	100.0

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1976-77
(Continued)**

Grade	Carlots	Percentage
OATS		
1 Canada Western	1	—
2 Canada Western	101	.6
Extra 3 Canada Western	175	1.0
3 Canada Western	3,567	22.7
Extra 1 Feed	902	5.7
1 Feed	9,491	60.5
2 Feed	825	5.2
3 Feed	137	.9
Mixed Feed	3	—
Tough	403	2.8
Damp	—	—
Rejected	45	.3
Others	39	.3
Total oats	15,689	100.0
BARLEY		
1 Canada Western Six-Row	99	.1
2 Canada Western Six-Row	7,684	9.2
1 Canada Western Two-Row	25	.01
2 Canada Western Two-Row	2,866	3.5
1 Feed	57,891	69.6
2 Feed	8,179	9.8
3 Feed	867	1.1
Tough	5,439	6.5
Damp	20	—
Rejected	79	.1
Others	71	.09
Total barley	83,220	100.0

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1976-77
(Continued)**

Grade	Carlots	Percentage
RYE		
1 Canada Western	13	.4
2 Canada Western	2,418	67.8
3 Canada Western	783	21.9
4 Canada Western	130	3.7
Ergoty	6	.2
Tough	211	5.9
Damp	—	—
Rejected	1	—
Others	6	.1
Total rye	3,568	100.0
FLAXSEED		
1 Canada Western	5,405	96.9
2 Canada Western	91	1.6
3 Canada Western	33	.6
4 Canada Western	6	.1
Tough	18	.3
Damp	—	—
Rejected	10	.2
Others	14	.3
Total flaxseed	5,577	100.0
RAPESEED		
1 Canada	18,429	96.1
2 Canada	297	1.6
3 Canada	120	.6
Others	327	1.7
Total rapeseed	19,173	100.0

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1976-77
(Concluded)**

Grade	Carlots	Percentage
OTHER GRAINS		
Corn	20	1.3
Sunflower Seed	155	10.2
Mixed Grain	168	11.1
Screenings	367	24.3
Buckwheat	253	16.7
Peas	157	10.4
Sample grain	3	.2
Mustard seed	206	13.6
Condemned grain	27	1.8
Canary seed	21	1.4
Faba beans	2	.1
Screening pellets	136	8.9
	1,517	100.0
Grand Total	363,214	

**A-4—Samples of Western Grain “Subject to Grade and Dockage” and Other
Unofficial Samples Inspected, Crop Year 1976-77
Compared with Crop Year 1975-76**

Point	1976-77	1975-76
	Number of Samples	
Winnipeg	16,792	18,448
Calgary	6,774	3,804
Edmonton	2,198	2,453
Moose Jaw	159	479
Saskatoon	151	1,590
Lethbridge	10,522	10,230
Vancouver	2,859	2,191
Totals	39,455	39,195

A-5—Unofficial Samples of Eastern Grain Inspected Crop Year

Point	1975-76	1976-77
	Number of Samples	Number of Samples
Chatham	9,284	8,130
Toronto	1,222	840
Montreal	30	113
Totals	10,536	9,083

A-6—Inward Carlot and Trucklot Re-inspections of Western Grain, Crop Year 1976-77

Point	Inspected	Re- Inspected	Un- changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	212,577	8,117	7,205	845	13	20	34
Winnipeg	7,357	898	783	103	6	2	4
Churchill	14,986	672	588	75	3	4	2
Moose Jaw	188	3	1	2	—	—	—
Saskatoon	2,720	273	243	25	2	1	2
Calgary	10,442	599	585	14	—	—	—
Edmonton	3,260	262	251	7	1	—	2
Lethbridge	10,555	2	—	2	—	—	—
Prince Rupert	6,691	323	278	45	—	—	—
Vancouver	117,147	5,005	4,651	297	5	34	18
Totals	385,923	16,153	14,585	1,415	30	61	62
Percentage of total carlots and trucklots	100.0	4.2	3.8	.4	*	*	*

* Less than 0.05%

A-7—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1976-77

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	12	3,145	124	57	968
Oats	129	1,846	17	65	4
Barley	196	3,444	279	90	18
Flaxseed	—	198	1	20	7
Rye	—	78	14	1	2
Mixed Grain	6	1	48	119	—
Corn	—	—	—	—	—
Buckwheat	—	—	—	—	32
Peas	1	35	—	—	—
Screenings	133	1,383	169	389	25
Rapeseed	—	48	354	1,139	3
Sample feed grain	15	44	9	13	—
Mustard seed	—	2	12	—	173
Sample grain	—	—	2	—	—
Sunflower	—	—	—	—	—
Canary seed	—	—	—	—	—
Broken wheat	8	—	—	—	—
Different grain	—	—	—	7	1
Triticale	—	—	—	—	16
Totals	500	10,224	1,029	1,900	1,249
Totals 1975-76	626	11,885	851	1,860	1,024

**A-7—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1976-77
(Continued)**

Grain	Saskatoon	Lethbridge	Vancouver Victoria and Prince Rupert	Churchill
Wheat	106	212	215	1
Oats	173	87	736	—
Barley	45	398	89	—
Flaxseed	5	4	5	—
Rye	—	60	6	—
Mixed grain	99	6	55	27
Corn	9	121	—	—
Buckwheat	—	—	3	—
Peas	—	—	—	—
Screenings	515	19	1,909	41
Rapeseed	2,041	43	4	—
Sample feed grain	11	1	—	—
Mustard seed	113	133	9	—
Sample grain	—	1	—	—
Canary seed	—	—	—	—
Sunflower	—	—	—	—
Beans	—	51	2	—
Totals	3,117	1,136	3,033	69
Totals 1975-76	3,972	260	1,478	6

A-8—Carlot Inspections of Eastern Grain, Crop Year 1976-77

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
2 Canada Eastern White Winter	—	—	102	102
3 Canada Eastern White Winter	—	—	9	9
Tough	—	—	1	1
Sample	—	—	1	1
Totals	—	—	113	113
CORN				
1 Canada Eastern Yellow	—	—	13	13
2 Canada Eastern Yellow	—	—	40	40
3 Canada Eastern Yellow	—	—	40	40
4 Canada Eastern Yellow	—	—	15	15
Tough	—	—	1	1
Totals	—	—	109	109
BEANS				
3 Canada Eastern Pea Beans	—	—	1	1
4 Canada Eastern Pea Beans	—	—	84	84
2 Canada Eastern Light Red Kidney	—	—	22	22
3 Canada Eastern Light Red Kidney	—	—	2	2
Sample	—	—	22	22
Totals	—	—	131	131
SOYBEANS				
1 Canada Yellow	—	—	64	64
2 Canada Yellow	—	—	10	10
Tough	—	—	11	11
Damp	—	—	6	6
Sample	—	—	14	14
Totals	—	—	105	105
Totals, all grains	—	—	458	458

A-9—Inspections of Eastern Grain in Cargoes, Bins, Trucks or Warehouses, Crop Year 1976-77

Grain	Montreal	Toronto	Chatham	Total
—bushels—				
Wheat	—	440,500	17,269,997	17,710,497
Barley	—	—	513,574	513,574
Corn	1,000	5,803	9,290,186	9,296,989
Flaxseed	—	893	—	893
Soybeans	3,732	—	284,361	288,093
Beans	—	—	2,555,461	2,555,461
Totals	4,732	447,196	29,913,579	30,365,507

A-10—Inward and Export Cargoes Sampled and Inspected, Crop Year 1976-77

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Bate Comeau	Port Cartier	Total
	—bushels—							
Eastern Grain								
Inward	3,921,472	—	—	—	—	—	—	3,921,472
Export	5,249,773	—	—	—	2,268,874	7,362,657	2,073,493	16,954,797
Western Grain								
Inward	3,290,377	2,185,067	3,514,718	1,236,579	—	—	2,618,358	12,845,099
Export	41,451,591	29,413,865	24,502,805	55,591,777	26,289,662	90,857,492	66,544,316	334,651,508
Totals	53,913,213	31,598,932	28,017,523	56,828,356	28,558,536	98,220,149	71,236,167	368,372,876

A-11—Grain Sampled but not Inspected, Crop Year 1976-77

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern Grain							
Carlots	26	—	—	—	—	—	26
Inward cargoes (bu.)	—	—	—	—	—	—	—
Outward cargoes (bu.)	—	—	—	—	—	—	—
Bin lots (bu.)	205,333	—	—	—	—	—	205,333
Western grain							
Carlots	175	—	—	—	—	—	175
Inward cargoes (bu.)	3,771,266	—	—	—	—	—	3,771,266
Outward cargoes (bu.)	—	—	—	—	—	—	—
Bin lots (bu.)	—	—	—	—	—	—	—
U.S.A. grain							
Carlots	—	—	—	—	—	—	—
Inward cargoes (bu.)	2,758,337	—	—	—	—	—	2,758,337
Outward cargoes (bu.)	267,344	—	4,928,179	—	2,564,326	11,219,506	18,979,355
Bin lots (bu.)	—	—	—	—	—	—	—
Totals—cars	201	—	—	—	—	—	201
—bushels	7,002,280	—	4,928,179	—	2,564,326	11,219,506	25,714,291

A-12—Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1976-77

Point	Wheat	Durum	Oats	Barley	Rye	Flaxseed
RECEIPTS						
	—bushels—					
Thunder Bay	280,530,635	50,098,723	47,646,161	117,965,706	3,963,623	7,580,015
Vancouver	153,368,206	13,132,395	3,118,410	66,739,006	4,935,159	5,406,435
Victoria	1,333,851	—	—	—	—	—
Prince Rupert	13,242,766	—	1,694	—	—	—
Churchill	17,437,114	—	—	11,818,696	—	277
Calgary	182,836	8,743	15,057	1,666,745	76,999	—
Edmonton	66,483	—	35,961	98,871	1,908	—
Lethbridge	279,175	5,879	98,122	968,307	162,067	2,081
Moose Jaw	92,850	177,089	—	5,198	5,397	4,904
Saskatoon	231,190	7,384	163,573	66,720	83	36,256
Totals	466,765,106	63,430,213	51,078,978	199,329,249	9,145,236	13,029,968
SHIPMENTS						
	—bushels—					
Thunder Bay	277,855,526	46,964,848	50,077,959	110,086,045	2,690,602	8,840,163
Vancouver	146,860,366	13,355,634	2,955,036	68,235,945	4,493,973	4,586,976
Victoria	1,853,374	—	—	2,417	—	—
Prince Rupert	12,265,945	—	—	—	—	—
Churchill	15,691,519	—	—	14,132,240	—	—
Calgary	195,058	8,743	16,035	1,714,261	70,187	1,999
Edmonton	68,067	—	64,644	155,484	1,908	—
Lethbridge	290,145	4,145	114,085	979,752	148,128	9,257
Moose Jaw	92,117	144,921	—	1,232	5,126	10,879
Saskatoon	305,178	7,384	66,039	82,889	—	12,464
Totals	455,477,295	60,485,675	53,293,798	195,390,265	7,409,924	13,461,738

**A-12—Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1976-77
(Continued)**

Point	Rapeseed	Buckwheat	Peas	Mustard Seed	Miscellaneous
RECEIPTS					
			—bushels—		
Thunder Bay	7,634,430	—	274,035	429,741	527,630
Vancouver	36,538,928	552,058	—	—	25,023
Victoria	—	—	—	—	—
Prince Rupert	2,007,975	—	—	—	—
Churchill	—	—	—	—	—
Calgary	719,248	—	—	—	1,255
Edmonton	3,083,881	—	—	—	366
Lethbridge	127,862	—	—	10,229	163,770
Moose Jaw	—	73,320	—	82,300	11,842
Saskatoon	4,598,061	—	—	97,084	9,961
Totals	54,710,385	625,378	274,035	619,354	739,847
SHIPMENTS					
			—bushels—		
Thunder Bay	7,205,593	—	371,511	560,171	485,314
Vancouver	33,945,694	651,773	—	—	24,367
Victoria	1,117	—	—	—	—
Prince Rupert	2,150,858	—	—	—	3,277
Churchill	—	—	—	—	—
Calgary	1,135,815	—	—	42,489	7,879
Edmonton	3,796,738	—	—	—	52,669
Lethbridge	149,297	—	—	16,540	159,040
Moose Jaw	4,691	72,640	—	169,914	13,520
Saskatoon	5,904,774	—	—	139,342	9,754
Totals	54,294,577	724,413	371,511	928,456	755,820

N.B. 1) Miscellaneous—Includes Mixed Grain, Sample feed Grain, Sunflower, Triticale, Corn and U.S. Corn.
Also Faba Bean

2) This statement does not include Canary Seed or Barley Malt.

A-13—Carlots Weighed, Leaking or with Missing or Defective Seals, in the Western Division

	1976-77	1975-76
Cars Weighed in	353,740	367,259
Cars Weighed Out	13,933	15,242
Inward Leaks	10,365	14,872
Inward Seals Missing or Defective	6,674	12,838

A-14—Average Reported Outturn Shortage on Vessel Shipments of Grain from Thunder Bay to Licensed Transfer Elevators, Crop Year 1976-77

Grain	Bushels Shipped	Shortage in Pounds per 1000 bushels	
		1976-77	1975-76
Wheat	264,002,954	43.56	41.26
Durum Wheat	39,762,820	45.61	41.19
Oats	17,093,074	26.54	32.15
Barley	89,755,305	21.89	29.14
Rye	1,395,717	79.61	63.37
Flaxseed	1,220,467	37.85	45.26
Rapeseed	—	—	53.02
Peas	297,011	68.85	—
Screenings (in tons)	80,279	2.04/ton	2.40/ton

A-15—Tough and Damp Grain Dried by Storage Position Crop Year 1976-77

Point	Artificial Drying			Natural Drying	Totals
	Tough	Damp	Tough and Damp		
	bu.	bu.	bu.	bu.	bu.
Thunder Bay					
Wheat	6,122,295	50,509	6,172,804	4,104,019	10,276,823
Durum	85,926	2,414	88,340	264,507	352,847
Oats	43,000	1,145	44,145	865,247	909,392
Barley	865,554	16,396	881,950	4,248,388	5,130,338
Rye	203,531	4,694	208,225	256,418	464,643
Flaxseed	3,272	—	3,272	42,836	46,108
Rapeseed	—	—	—	2,048	2,048
Sunflower Seed*	2,769	—	2,769	—	2,769
Totals	7,326,347	75,158	7,401,505	9,783,463	17,184,968
Pacific Coast					
Wheat	1,919,481	48,136	1,967,617	1,926,018	3,893,635
Durum	—	—	—	15,955	15,955
Oats	—	—	—	97,865	97,865
Barley	4,511,896	34,796	4,546,692	2,268,813	6,815,505
Rye	7,885	—	7,885	122,704	130,589
Flaxseed	—	—	—	21,376	21,376
Rapeseed	—	—	—	7,089	7,089
Buckwheat	—	—	—	5,302	5,302
Totals	6,439,262	82,932	6,522,194	4,465,122	10,987,316
Interiors					
Wheat	410	30,810	31,220	1,708	32,928
Durum	—	—	—	598	598
Oats	7,201	—	7,201	—	7,201
Barley	21,433	12,968	34,401	10,344	44,745
Rye	—	—	—	—	—
Flaxseed	—	—	—	17	17
Rapeseed	—	—	—	2,660	2,660
Mixed Grain**	—	29,283	29,283	—	29,283
Totals	29,044	73,061	102,105	15,327	117,432
Churchill					
Wheat	—	—	—	1,411,321	1,411,321
Barley	—	—	—	641,416	641,416
Totals	—	—	—	2,052,737	2,052,737
Totals—All Positions	13,794,653	231,151	14,025,804	16,316,649	30,342,453

N.B. —INTERIORS:

Special Bin Corn 25,900 bushels not included in above figures.

* In bushels of thirty pounds

** In bushels of fifty pounds

A-16—Quality Data for Grades of Red Spring Wheat Exported, Crop Year 1976-77

	1 C.W. Red Spring				2 C.W. Red Spring				3 C.W. Red Spring	
	15.0	13.5	12.5	11.5	13.5	12.5	11.5	*	*	
Test weight (Avery) lb/bu	67.2	67.7	67.9	68.0	65.2	66.2	66.8	67.0	65.2	
1000 kernel weight, g	28.9	30.1	31.1	31.1	28.7	30.4	31.4	31.1	30.1	
Wheat protein content, %**	15.2	13.5	12.8	11.9	13.7	12.6	11.9	11.9	12.3	
Falling number, sec	415	400	405	395	315	350	375	380	355	
Flour protein content, %***	14.8	13.1	12.1	11.4	13.0	12.0	11.2	11.4	11.6	
Flour yield, %	75.6	75.5	75.3	76.9	75.2	75.3	75.5	75.7	73.6	
Flour ash content, %	0.45	0.45	0.45	0.48	0.50	0.49	0.48	0.51	0.51	
Flour diastatic activity, mg	170	187	193	197	208	211	198	218	225	
Baking absorption, %	65.0	64.0	62.0	60.0	64.0	63.0	61.0	62.0	63.0	
Loaf volume, cm ³	930	850	765	715	840	760	710	710	720	

* Not segregated by protein content.

** 13.5% moisture basis.

*** 14.0% moisture basis.

A-17—Official Inspections Appealed, Crop Year 1976-77

Item	Carlots	Percentage
Left as graded	201	89.7
Grades raised	21	9.3
Grades lowered	1	.5
Dockage lowered	1	.5
Totals	224	100.0

A-18—Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1977

Port of Discharge	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed
—cents per bushel—						
Georgian Bay Ports, Goderich and Sarnia	10.28	11.46	9.93	14.75	—	—
Port Colborne	12.87	15.00	—	—	—	—
Toronto	14.89	14.78	19.49	—	17.33	—
Kingston	13.75	—	—	—	—	—
Prescott	16.31	15.13	16.04	—	—	—
Montreal	16.13	14.77	15.64	16.41	—	—
Sorel	16.18	14.88	15.38	—	—	—
Three Rivers	16.14	14.38	15.63	—	—	—
Quebec	16.13	14.75	15.39	—	—	—
Baie Comeau	16.13	—	15.45	20.48	—	—
Port Cartier	16.13	13.38	15.38	17.38	—	—
Halifax	28.50	—	31.00	—	—	—
Other Maritime Ports	75.03	58.25	75.15	—	—	—
Buffalo	20.00	—	—	20.00	—	—
Manitowoc	—	—	17.50	—	—	—
Milwaukee	—	—	15.07	—	—	—

APPENDIX B

Amendments to Canada Grain Regulations

As the various segments of the Canadian grain industry had decided to convert from Imperial units of measurement to metric units, effective February 1, 1977, the Commission amended all pertinent portions of the Canada Grain Regulations by deleting references to Imperial units such as pound, bushel and inch, and substituting appropriate metric units—gram, tonne and millimetre. However, legislation relating to metric conversion and amending several statutes concerned with grain marketing was not passed by Parliament and given Royal Assent until August 5, 1977. The Commission, therefore, found it necessary to postpone implementation of the changeover and to make further amendments to the Regulations to formally reinstate the Imperial units, effective August 1, 1977.

Proclamations were issued on October 27, 1977 and October 31, 1977 to bring the parliamentary legislation (Chapter 55 of the Statutes of Canada, 76–77) into force on February 1, 1978, and the Commission proceeded with preparation of new amendments to the Regulations to facilitate the official conversion to metric units.

Included in the amendments which became effective August 1, 1977 were revisions of Schedule I—Fees of the Commission, and Schedules VII, VIII and IX—Maximum Tariffs of Elevator Charges. The maximum tariffs were adjusted in instances where the Commission was satisfied that increases were justified by higher costs of elevator operation.

Effective August 1, 1977, grades and detailed specifications were established in Schedule III for Experimental Grades of Wheat (Canada Western) and Experimental Grades of Barley (Canada Western). These are intended to provide specific but temporary grade designations for unlicensed varieties during the period of their market testing by the Canadian Wheat Board.

Western Grain Standards Committee as at August 1, 1977

H. D. Pound V. Duke Dr. G. N. Irvine P. Edwards	Chief Commissioner Chief Grain Inspector Chief Chemist Chairman, Grain Appeal Tribunal	}	Canadian Grain Commission
Dr. J. W. Morrison G. C. Pratt	representing the Canada Department of Agriculture		
F. M. Hetland	representing the Canadian Wheat Board		
N. H. McClure D. W. Elliott	representing processors of grain		
G. E. Gould H. S. McDonald	representing exporters of grain		
J. I. Miller R. E. Hadland E. Axelson H. R. Patching E. Kure H. G. Yelland A. K. Sahl G. McEwen F. Brown J. D. Deveson F. Simpson R. Green	representing producers of western grain		
J. E. Dehod J. Stangeland	additional*		

* Appointed pursuant to Section 17(2)(h) to provide additional expertise on Committee.

Eastern Grain Standards Committee as at August 1, 1977

H. D. Pound V. Duke Dr. G. N. Irvine	Chief Commissioner Chief Grain Inspector Chief Chemist	}	Canadian Grain Commission
Dr. J. W. Morrison	representing the Canada Department of Agriculture		
C. F. Bowker D. D. Wright M. Pardo M. Landry	representing processors and exporters of grain		
P. MacKinnon C. Wilson B. Sanford K. Patterson	representing producers of eastern grain		
M. H. McPhail W. Sim J. E. Peill	additional*		

* Appointed pursuant to Section 17(3)(e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Canada Grain Regulations</i>	
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Exports of Canadian Grain</i>	Monthly
<i>Canadian Grain Exports</i>	Annually
<i>Marketings, Distribution and Visible Carry-over of Canadian Grain</i>	Annually
<i>Grain Elevators in Canada</i>	Annually
<i>Summary of Primary Elevator Receipts at Individual Prairie Points</i>	Annually
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Canadian Red Spring Wheat. Crop Bulletin</i>	Annually
<i>Canadian Amber Durum Wheat. Crop Bulletin</i>	Annually
<i>Canadian Barley. Crop Bulletin</i>	Annually
<i>Canadian Flax and Rapeseed. Crop Bulletin</i>	Annually
<i>Canadian Wheat Cargoes. Bulletin</i>	Quarterly
<i>Canadian Durum Cargoes. Bulletin</i>	Quarterly
<i>Map of Western Canada Showing the Protein Content of Hard Red Spring Wheat</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Grain Grading Handbook for Eastern Canada</i>	
<i>Grain Grading Handbook for Western Canada</i>	
<i>Varietal Identification of Barley, Wheat and Small Oilseeds</i>	
<i>Canada's New Grades of Red Spring Wheat</i>	
<i>Handbook on the Sale and Handling of Grain through a Primary Elevator</i>	
<i>The Key to Canada's Certificate Final is Uniform Quality</i>	

Further information on Canadian Grain Commission Laboratory scientific and technical publications will be found in the Laboratory's 1977 Annual Report.

APPENDIX D

D-1—REVENUE—By Location and Division
Fiscal Year Ended March 31, 1977

LOCATIONS	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Victoria		34	17				51	62
Vancouver		1660	845	185			2690	2506
Prince Rupert		96	54			1999	2149	2557
Lethbridge		34				239	273	336
Calgary		53	36			490	579	826
Edmonton		49				1105	1154	863
Saskatoon		63	48			1945	2056	1982
Moose Jaw		6				136	142	666
Churchill		207	107				314	251
Winnipeg	7	147	64	426		† 243	887	1223
Thunder Bay		3391	1702				5093	5334
Toronto		18					18	16
Chatham		219					219	211
Montreal		24		43			67	86
Baie Comeau		3	20				23	23
Port Cartier		4					4	10
Three Rivers		4					4	3
Quebec								4
Sorel		2					2	4
Total Current Year	7	6014	2893	654		6157	15725	
Total Previous Year	8	6131	2895	484	1	7444		16963

* Elevator & Grain Documentation

** Grain Testing and Research

† Includes net results of weighovers totalling \$232,000.

D-2—EXPENDITURES—By Location and Division
Fiscal Year Ended March 31, 1977

LOCATIONS	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Victoria		58	39				97	108
Vancouver		1238	867	266			2371	2324
Prince Rupert		70	66			3347	3483	3901
Lethbridge		87				413	500	587
Calgary	40	285	48			688	1061	1898
Edmonton		112				914	1026	877
Saskatoon	37	137	63			2134	2371	1410
Moose Jaw		68				809	877	780
Regina	39						39	37
Churchill		41	46				87	75
Winnipeg	768	1581	376	884	2223	269	6101	5378
Thunder Bay		3384	2048	386			5818	5745
Toronto		35					35	32
Chatham		273					273	238
Harrow	28						28	29
Montreal		487	67	67			621	592
Baie Comeau		80	11				91	80
Sorel		67					67	53
Port Cartier		64					64	58
Quebec City		70					70	65
Three Rivers		53					53	49
Employee Benefits	89	902	442	172	192	436	2233	2133
Total Current Year	1001	9092	4073	1775	2415	9010	27366	
Total Previous Year	842	8747	3984	1553	2227	9096		26449

* Elevator and Grain Documentation
 ** Grain Testing & Research

D-3—REVENUE—By Type and Division
Fiscal Year Ended March 31, 1977

TYPE	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Grain Sales								
—Samples		25					25	32
—Surplus						128	128	266
—Screenings						1605	1605	1150
—Weighovers						232	232	710
Services and Service Fees								
—Inspection		5981					5981	6082
—Weighing			2893			41	2934	2944
—Storage						912	912	968
—Elevation						2084	2084	2644
—Drying						138	138	580
—Cleaning						777	777	779
—Grain Documentation				608			608	434
—Other	7	7				102	116	18
Licenses				46			46	48
Refund of Previous Year Expenditures							—	9
Miscellaneous								
Grade Promotions						117	117	151
Other		1				21	22	148
Total Current Year	7	6014	2893	654	—	6157	15725	
Total Previous Year	8	6131	2895	484	1	7444		16963

* Elevator and Grain Documentation
** Grain Testing & Research

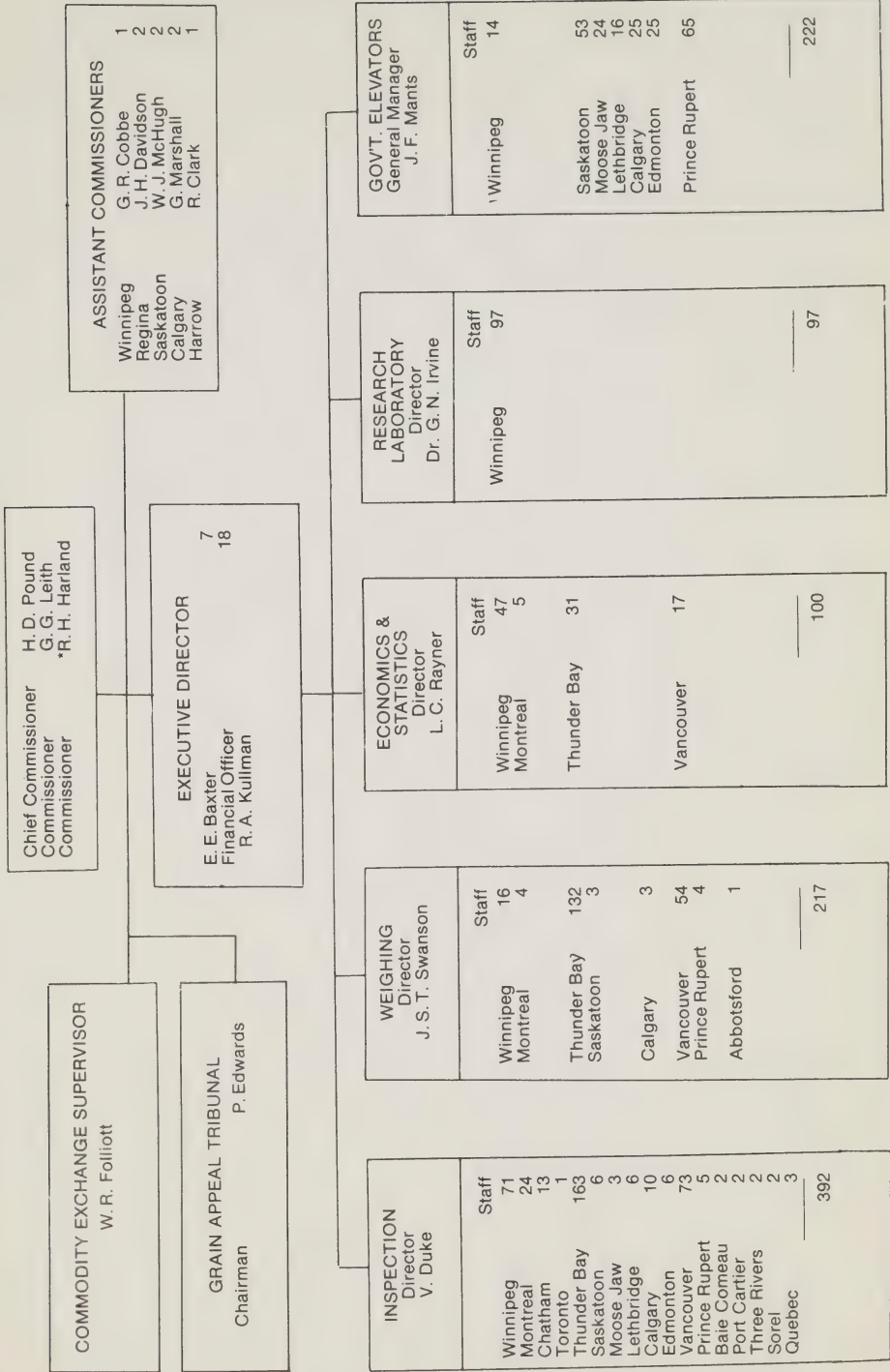
D-4—EXPENDITURES—By Type and Division
Fiscal Year Ended March 31, 1977

TYPE	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics & Statistics*	Research Laboratory**	Canadian Government Elevators		
					\$(000)			
Salary & Employee Benefits	684	7871	3838	1337	1492	3512	18734	17656
Travel	64	176	119	16	26	28	429	466
Postage, Freight & Cartage	33	144	1	2	23	6	209	178
Telephone/Telegraph	18	50	13	29	17	37	164	149
Advertising	1			2			3	2
Dept. Publications	3			19	15		37	30
Prof. & Special Services	12	14	4	8	16	99	153	131
Rent—Buildings	138	359	58	133	516	624	1828	1564
—Equipment	4	5	2	183	6	19	219	208
Purchased Repair and Upkeep								
—Bldgs. & Works	1				1	4	6	59
—Equipment	2	18		3	10	63	96	32
Utilities		1				279	280	254
Grants in lieu of Taxes						565	565	516
Screenings						165	165	232
Printing & Stationery	34	31	24	34	27	10	160	146
Other Materials and Supplies	2	78	3	2	132	490	707	511
Expenditures, Other						24	24	101
Grants & Contributions					1		1	2
Building Expenditures	1	50		3		643	697	223
Office Equipment	4	4	9	4	3	4	28	37
Other Capital Equipment		291	2		130	2438	2861	3952
Total Current Year	1001	9092	4073	1775	2415	9010	27366	
Total Previous Year	842	8747	3984	1553	2227	9096		26449

* Elevator & Grain Documentation
 ** Grain Testing & Research

APPENDIX E

CANADIAN GRAIN COMMISSION



* Appointed September 28, 1977 to replace C. L. Shuttleworth

As at July 31, 1977
Includes full time and casual staff





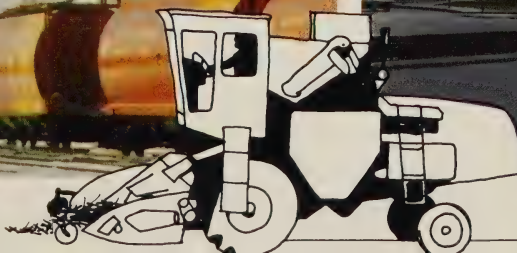
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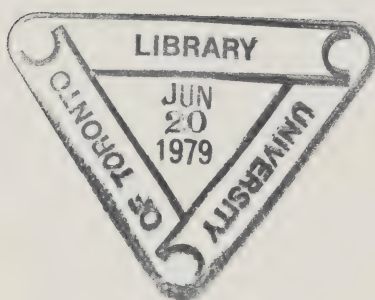
GRAIN COMMISSION



**Agriculture
Canada**

Minister
Hon. Eugene Whelan

Deputy Minister
Gaetan Lussier



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CANADIAN GRAIN COMMISSION

Winnipeg, Manitoba
February 28, 1979

The Honourable Eugene Whelan,
Minister of Agriculture,
OTTAWA, Canada.

Sir:

In compliance with Section 14 of the Canada Grain Act, the 1978 Annual Report of the Canadian Grain Commission is hereby submitted.

The document provides information and statistics relating to the quality and volume of grain handled in the licensed elevator system during the 1977-78 crop year, outlines the quality of the 1978 grain crop, and reviews the Commission's principal activities during that year.

Respectfully submitted,

H. D. Pound
Chief Commissioner

George G. Leith
Commissioner

R. H. Harland
Commissioner

R. S. Allen
Administrative Assistant

R. A. Gosselin
Recording Secretary

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SECTION 1—INTRODUCTION

Pursuant to the Canada Grain Act, the Canadian Grain Commission must, in the interest of grain producers, regulate grain handling in Canada and establish and maintain standards of quality for Canadian grain to ensure a dependable commodity for both domestic and export markets.

The *Commission* is responsible for carrying out the provisions of the Canada Grain Act. It must, through close contact with all segments of the grain industry, develop and implement policies to meet the broad objectives of the Act.

The *Executive Director* plans, co-ordinates and administers the activities of all Divisions and assists in the development and implementation of Commission policies.

The *Inspection Division* is responsible for the quality control of Canadian grains and oilseeds. The Division prepares primary and export standard samples, officially inspects grain at licensed terminal and transfer elevators and supervises and controls the treatment of grain.

The *Grain Research Laboratory* assesses the quality of new crops, monitors the quality of grain moving through the licensed elevator system and conducts basic and applied research on grain and grain products.

The *Weighing Division* supervises the weighing of grain at licensed terminal and transfer elevators, examines and tests scales at those houses, regularly audits their physical stocks and conducts investigations of excessive overages and shortages of grain.

The *Economics and Statistics Division* collects and distributes grain handling statistics. It provides documentary services to the industry, licenses participants, supervises the bonding of licensees and insurance of stocks and conducts economic and statistical studies for the Commission.

The *Canadian Government Elevators* operates and maintains six terminal elevators. The facilities provide increased capacity for handling, storing and treating grains and oilseeds.

Five *Assistant Commissioners* supervise the operations of licensed primary elevators and deal with producer inquiries and complaints.

The *Grain Appeal Tribunal* examines appeals of persons dissatisfied with the grade assigned by a Commission inspector on the official inspection of a sample of grain.

The *Eastern and Western Grain Standards Committees* review and recommend new grades and grade changes as well as examine and recommend the actual primary and export standard samples.

The *Supervisor of the Commodity Exchange* supervises futures trading in Canada under the terms of the Grain Futures Act.

The Commission's organization chart can be found at Appendix E of this report.



SECTION 2—PRODUCTION, QUALITY AND DISPOSITION OF GRAIN

Grain Supplies and Disposition—1977-78

The high level of activity, which characterized the previous crop year, continued through the 1977-78 period. Record producer deliveries and near record export shipments were the highlights of the year.

An estimated 18.6 million tonnes of wheat, oats, barley, rye, flaxseed and rapeseed were carried over into the 1977-78 season; this was the largest carry-over since 1972. The 1977 harvest included 19.9 million tonnes of wheat, 4.3 million tonnes of oats, 11.8 million tonnes of barley, 0.4 million tonnes of rye, 0.7 million tonnes of flaxseed and 2.0 million tonnes of rapeseed. The inward carry-over and that year's production meant that some 57.6 million tonnes of grains and oilseeds were available for domestic and export utilization.

Producers delivered a record total of 28.1 million tonnes of the principal grains to the licensed elevator system. This was 11% or 2.8 million tonnes more than during the 1972-73 crop year. Deliveries of 19.5 million tonnes of wheat and 1.8 million tonnes of rapeseed were all-time highs.

Exports of the six principal grains stood at 20.2 million tonnes; this was only 647 thousand tonnes less than the record set during the 1972-73 crop year. Durum wheat exports totalled 1.8 million tonnes, a new record high.

The total 1977-78 commercial disappearance included 21.1 million tonnes of exports and 16.0 million tonnes that were disposed of domestically. Despite this high disappearance, closing stocks as of July 31, 1978 had increased significantly to 20.5 million tonnes.

Grain Marketing and Quality—1977-78

Red Spring Wheat. Red spring wheat marketed by western Canadian producers during the crop year amounted to 17.3 million tonnes, an increase of 29% over the 13.4 million-tonne total of the previous crop year. Railway carlot shipments from primary elevators were distributed between the grades as follows: No. 1 Canada Western, 54.5%; No. 2 Canada Western, 12.5%; No. 3 Canada Western, 17.5%. The percentage of country elevator carlot shipments with a moisture content in the tough and damp range was 10%—a significant increase.

Exports during the crop year totalled 12.5 million tonnes of which slightly more than half were shipped through Atlantic ports. The predominant grade exported from Atlantic ports (including Thunder Bay) was No. 1 Canada Western 12.5% protein, followed by No. 1 Canada Western 13.5% protein. At the Pacific coast the predominant grade exported was No. 3 Canada Western, followed by No. 1 Canada Western 13.5% protein. All grades of Atlantic cargoes were lower in test weight than the previous crop year. Flour yield and flour ash levels tended to be slightly lower for the milling grades, while baking absorption was slightly higher. For Pacific cargoes, all grades were lower in test weight. All grades except No. 2 C.W. were slightly lower in flour yield,

but flour ash levels were lower and hence improved. Loaf volume tended to be slightly higher.

Amber Durum Wheat. Amber durum wheat marketed by producers in Western Canada in the 1977-78 crop year totalled 1.8 million tonnes, an increase of over 18% over the previous crop year. The grade distribution of the carlot movement was as follows: No. 1 C.W., 50.6%; No. 2 C.W., 33.2%; No. 3 C.W., 10.8%; No. 4 C.W., 3.5%. Durum wheat marketings were higher in test weight for all grades except No. 3 C.W. Semolina and spaghetti pigment levels were higher for all grades except No. 1 C.W. Spaghetti color was satisfactory for all grades.

Exports of amber durum wheat during the year totalled almost 2 million tonnes. Atlantic shipments, representing 84% of the total, were higher in kernel weight and in semolina and spaghetti pigment levels; spaghetti color was also better. Pacific exports of durum wheat were higher in kernel weight than Atlantic shipments but semolina yields were about the same. Semolina and spaghetti pigment levels for the No. 1 and No. 2 C.W. Pacific shipments were slightly lower than for the Atlantic shipments. Spaghetti color was quite similar for both destinations.

Barley. Barley marketed in Canada in the 1977-78 crop year totalled 5.3 million tonnes, a decrease of almost 9% from the level of the previous crop year. Slightly under 9% of the carlot movement entered the six-row grades with the two-row grades representing over 4%. The predominant grade was, as usual, No. 1 Feed; it accounted for 62% of the movement. The proportion of the crop graded tough or damp was over 16%, up markedly from the previous year. Barley marketings were higher in percentage of plump barley and in test weight (except for the No. 1 Feed grade) while the enzymatic activity of the barley was lower. Barley exports totalled 3.3 million tonnes. Of this, six-row malting grades totalled 147 thousand tonnes and two-row malting grades, 201 thousand tonnes; both were up significantly.

Oats. Producers' marketings of oats in the 1977-78 crop year totalled 772 thousand tonnes, a decrease of nearly 9% from the previous level. The proportion of the 1977-78 carlot movement entering the grades No. 1 and No. 2 C.W. was 14.5%, compared with less than 1% in the preceding crop year. The protein content was generally lower.

Rye. Producers' marketings of rye in the 1977-78 crop year totalled nearly 2.6 million tonnes, a decrease of about 12%. The predominant grade was No. 1 C.W. and represented 59% of the total movement; No. 2 C.W. was the predominant grade in the previous crop year.

Flaxseed. Flaxseed marketings more than doubled, totalling 504 thousand tonnes. The predominant grade was No. 1 C.W. with an oil content averaging 43.2% (dry basis), an increase of nearly 1 unit from the level of the previous period. Protein content of the oil-free meal from No. 1 C.W. seed averaged 39.6%, down slightly from the previous year's level.

Rapeseed. Primary marketings of rapeseed amounted to more than 1.7 million tonnes, an increase of 70%. The predominant grade, No. 1 Canada

Rapeseed, averaged 42.1% in oil content (8.5% moisture basis), fractionally higher than the previous crop year level. The protein content of the oil-free meal from No. 1 Canada Rapeseed was also somewhat higher, averaging 36.5%. The erucic acid level of the rapeseed movement again decreased significantly to an average of 1.7%.

Domestic Mustard Seed. Inward carlot inspections of domestic mustard totalled 634, a substantial increase over the 1976-77 level of 206 carlots. The predominant grade was No. 1 C.W. Brown.

Domestic Buckwheat. The carlot inspections of domestic buckwheat reached a figure of 451, compared to the 251 that were inspected during 1976-77. Most of the buckwheat was graded No. 1 Canada.

Eastern White Winter Wheat. Carlot inspections of Eastern White Winter wheat decreased slightly to 105 from 113. The predominant grade was No. 2 Canada Eastern; it accounted for 101 carlots.

Eastern Corn. A total of 502 carlots of eastern corn were inspected during the year, a substantial increase over the figure of 109 for 1976-77. The No. 2 and No. 3 Canada Eastern Yellow grades accounted for 318 and 118 carlots respectively.

Eastern Soybeans. The number of carlot inspections decreased substantially from the previous period's level of 458; only 42 carlots were inspected in 1977-78. The majority were graded No. 2 Canada Yellow.

Growing Conditions, Grades and Quality of the 1978 Crop

During the winter of 1977-78, the amount of snowfall in the southern portions of the Prairies was normal to above normal. Moisture supplies in early spring were above normal and thus seeding was delayed until about the third week of May. Seeding was virtually completed by the first week of June.

Germination and early growth of the crop were excellent because of the favourable weather and moisture conditions in most regions. Weed infestations were heavy in areas with ideal moisture conditions. Crop conditions were excellent through the Prairies except for the northern and central areas of Alberta and parts of central Saskatchewan which received excessive moisture during June and early July; this caused some crop deterioration. The balance of July and early August was hot, dry and windy over almost all of the Prairies. This hampered the full maturing of the crop, particularly in Alberta. Frost occurred in some areas in early August and mid-August. A major hail-storm in northeastern Alberta at the end of the second week in August caused considerable damage.

Harvesting was under way by mid-August and early harvested grain was of good quality. However, widespread rains and cool weather affected all areas in the latter part of August and into September. Harvesting was seriously delayed and for the second year in a row substantial quantities of the crop were downgraded on account of weather staining, mildew and sprouting. A significant improvement in the weather during the latter part of September and

early October enabled producers to combine much of the crop. By the middle of October, virtually all of the crops were off, with the exception of areas in northeastern Saskatchewan, northwestern Manitoba and an area northwest of Edmonton.

Red Spring Wheat. The 1978 western Canadian red spring wheat crop is estimated by Statistics Canada (as of November 15, 1978) at 17.7 million tonnes, a slight increase over the 17.6 million-tonne crop in 1977. Carry-over of red spring wheat from previous crops at July 31, 1978 was estimated to be 9.8 million tonnes. The Commission estimates that 30% of the 1978 crop will qualify for No. 1 C.W. grade, 32% for No. 2 C.W., and 27% for No. 3 C.W. The balance will enter the Canada Utility grades with 7.5% qualifying for No. 3 C.U.

The protein content of the 1978 red spring wheat crop (as at December 12, 1978) is estimated at 13.0% compared with 13.1% for the 1977 crop and with the average level of 13.7% for the twenty-year period from 1958 to 1977. New-crop wheat from Alberta is highest in protein content this year averaging 13.2, followed by Manitoba at 13.0 and Saskatchewan at 12.5%.

Amber Durum Wheat. Statistics Canada estimates (as of November 15, 1978) placed western Canadian production of amber durum wheat at 2.8 million tonnes, an increase of 116% over the 1977 crop. The Commission estimates that the distribution between the grades of the 1978 crop will be as follows: No. 1 C.W., 17%; No. 2 C.W., 26%; No. 3 C.W., 23%; No. 4 C.W., 27%, and No. 5 C.W., 7%.

The average protein content of the 1978 crop is estimated to be 12.9% compared with the average of 13.4% for the 1977 crop. The hectolitre weight and 1000 kernel weight of all grades, although slightly lower this year than last, are satisfactory. Semolina and spaghetti pigment levels are generally higher than last year and spaghetti color is good.

Barley. Western Canadian production of barley in 1978 is estimated by Statistics Canada (as of November 15, 1978), at 9.7 million tonnes compared with 11.2 million tonnes in 1977. The adverse harvesting conditions downgraded the barley crop and the Grain Commission estimates that 64% will grade No. 1 Feed. Only 11% will qualify for the Canada Western six-row and two-row grades. The protein content of the crop is lower in 1978 than in 1977, particularly for the malting grades.

Flaxseed. Production of flaxseed in Western Canada in 1978 is, according to Statistics Canada (at November 15, 1978) 558.8 thousand tonnes, a decrease of nearly 92 thousand tonnes from the previous year's production. The Commission estimates that 88% of the crop will enter the No. 1 C.W. grade this year, up markedly from 1977, and 10%, the No. 2 C.W. grade. The oil content of new-crop flaxseed averages 43.5% compared with 44.3% in 1977. The protein content of the oil-free flaxseed meal is higher this year, at 41.4%. The iodine value of the oil is 190 units this year.

Rapeseed. The 1978 crop of western Canadian rapeseed is estimated by Statistics Canada (at November 15, 1978) at a record 3.4 million tonnes. Grades are generally higher this year than last and the Commission estimates that 81% will enter the No. 1 Canada Rapeseed grade, 14% the No. 2 grade,

and 3% the No. 3 grade. The oil content of new-crop rapeseed averages 41.2% (8.5% moisture basis) down slightly from 41.9% in 1977. Protein content of the oil-free meal is 1 unit higher this year, 37.4%.

Eastern White Winter Wheat. Production of white winter wheat in southwestern Ontario in 1978 is estimated to be 373 thousand tonnes, a marked decrease from the 822.5 thousand-tonne crop in 1977. The average protein content of the 1978 crop is estimated to be 10.9%, the highest level ever encountered in 15 years of Grain Commission surveys of this crop. The predominant grade in the 1978 crop is No. 2 C.E.; its protein content is 10.9% while the No. 1 C.E. grade averages 11.0%.

Eastern Canadian Soybeans. As at November 15, 1978, the new crop production of soybeans was estimated by Statistics Canada to be 475.1 thousand tonnes, a 9.9% decrease from the 1977 production of 527.4 thousand tonnes. The predominant grade is expected to be No. 1 or No. 2 Canada Yellow.

Eastern Corn. Eastern production of corn for grain is expected to be 4.1 million tonnes, a slight decrease from the 4.2 million tonnes that were harvested during the 1976-77 crop year. Most of the commodity is expected to grade either No. 1 or No. 2 C.E. Yellow.

Eastern Pea Beans. It is estimated that production will amount to over 85 thousand tonnes, a figure which would represent a substantial increase over the 50 thousand tonnes that were harvested in 1976-77. Quality has improved dramatically, with most of the beans grading No. 1 Canada Eastern.



SECTION 3—REGULATION OF GRAIN HANDLING

Licensing and Related Activities

Licensing. During the year, the total number of licences and the total licensed storage capacity continued to decline, a trend that has been continuing for some time. Licences in force have decreased since 1955, when 5,542 licences were issued, while the total storage capacity has been declining since the 1970 high of 19 603 111 tonnes.

A total of 3,778 licences for all categories were issued by the Commission as of August 1st, 1978. This represents a 1.1% reduction from the figure of 3,851 for the previous year. The total licensed storage capacity stood at 16 858 030 tonnes, down 0.7% from the level of 16 973 630 tonnes for the preceding year.

Some 3,658 primary elevator licences were issued, for a total storage capacity of 9 245 450 tonnes. The capacity of the terminal system was 3 542 000 tonnes, compared to transfer elevator storage of 3 485 000 tonnes.

Bonding. Guarantee bonds executed by 30 surety companies were deposited with the Commission by licensees. All licensees must provide security to cover their outstanding liabilities and the Commission continually monitored these liabilities for adequacy of security values.

Insurance. Elevator licensees must maintain adequate insurance on their grain stocks. Insurance policies were filed with the Commission and the level of stocks was monitored to ensure licensees maintained adequate insurance coverage.

Documentation

Statistics. The Economics and Statistics Division is the principal Canadian source of grain handling, storage and movement statistics. These statistics are an important element of the Commission's control and supervision of the overall bulk handling system.

These statistics are compiled from the prescribed records and periodic reports that are submitted by licensees as well as from data compiled as a result of Commission operations in licensed elevator systems. Corresponding data from the Wheat Board and from other organizations and associations within the grain trade are also used by the Division.

The statistics are published in comprehensive bulletins and reports on the quantity of Canadian grain that was handled and stored within the elevator system and that moved to domestic and export markets. The documents are used extensively by Commission employees and are distributed throughout Canada and the world.

The Division worked in close collaboration with the Canadian Wheat Board, the Agriculture Division of Statistics Canada, the Canada Grains Council and other provincial and federal organizations. It exchanged data and provided statistical assistance with the Commonwealth Economics Committee, the Food and Agriculture Organization of the United Nations, the Inter-

national Wheat Council and the United States Department of Agriculture.

Appendix C lists the Division's principal statistical releases and Appendix A contains statistics pertaining to the 1977-78 crop year.

Documentation Services. The Economics and Statistics Division provides a documentation and reporting service on the receipts and shipments of licensed terminal elevators. Certificates, terminal receipts and terminal elevator outturns are produced and issued from information that is extracted from reports of the Inspection and Weighing Divisions; these are distributed throughout the grain industry. A telecommunications network is used to transmit data from the Commission's data processing center to the elevator companies, railways and the Canadian Wheat Board. The information distributed in this fashion is an essential element of the accounting systems of these organizations. It will be used, as well, to compile and prepare the statistics published by the Division.

Registration. When grain is received at a terminal or transfer elevator, the operator must issue an elevator receipt. These receipts are first registered by the Economics and Statistics Division's offices in Winnipeg, Vancouver and Montreal and these documents are used as collateral by the operators to finance grain movement. The Division then cancels the receipts after shipment of the grain.

Primary Elevators

Tariff of Charges. The maximum tariff of charges for licensed primary elevators was revised by converting the rates to the metric tonne unit of measurement, effective February 1, 1978. Maximum rates for elevation and custom drying were increased on August 1, 1978 to reflect higher costs of elevator operations. The maximum elevation rates were established at \$5.80 per tonne for wheat and rye, \$9.50 per tonne for oats, \$7.20 per tonne for barley, and \$6.85 for flaxseed and rapeseed.

Inspection of Elevators. The licensed primary elevators are regularly inspected by the four Assistant Commissioners located at Winnipeg, Saskatoon, Regina and Calgary. Their inspections keep the Commission in close touch with primary elevator operations throughout the Prairies. The Assistant Commissioner located at Harrow, Ontario provides a liaison between the Commission and the Ontario grain industry. The Assistant Commissioners are also responsible for ensuring that licensees adhere to the Canada Grain Act and Regulations.

During 1977-78, the Assistant Commissioners inspected 2,376 primary elevators. This represents 449 elevators in Manitoba, 1,390 in Saskatchewan and 537 in Alberta.

In addition to maintaining detailed records of individual elevator operations, the Assistant Commissioners investigate any reported infractions of Commission regulations and orders. They deal with enquiries on any matter relating to Commission operations, conduct special investigations, surveys and projects and publicize the work of the Commission.

Weigh-overs. Licensed grain handling companies are responsible for conducting regular weigh-overs of the licensed primary elevators that they operate. The results of these weigh-overs are summarized in the table below. These results and other related records are carefully reviewed and if circumstances warrant, discussions are held with company management. Where overages and shortages so require, the Assistant Commissioners will deal directly with elevator managers and superintendents. Operators must undertake any necessary remedial action that is recommended by the Commission.

Elevators reporting	1977-78	1976-77
Shortages	355	251
Neither overages nor shortages	48	40
Overages of less than .25%	477	395
Overages of .25% to .50%	261	204
Overages over .50%	144	86
Total number of elevators weighed over	1,285	976

Terminal, Process and Transfer Elevators

Tariffs of Charges. The maximum tariffs of charges for terminal and transfer elevators were amended to convert the rates from the bushel unit to the metric tonne unit of measurement, effective February 1, 1978. Maximum rates for some items in these tariffs were increased effective August 1, 1978 as a result of submissions to the Commission by elevator operators relating to current and predicted costs of grain elevator operation and maintenance. Provision was made in the amended terminal elevator tariff for a further increase in the maximum elevation rate to take effect on January 1, 1979. This will enable terminal elevator operators to adjust their rates to meet anticipated capital expenditures for installation of additional dust collection and anti-air pollution equipment.

Formal submissions relating to costs of operation and tariffs of charges for terminal elevators and primary elevators were received by the Commission from the grain industry at a public meeting held in Saskatoon on March 29 and 30, 1978.

Inspection of Equipment and Facilities. Elevator operators must ensure that the premises are appropriate for the storage and handling of grain. The elevator and its equipment must be of a condition, type and size that will allow the licensee to operate the elevator in accordance with his licence. Commission employees, therefore, continually maintain supervision of facilities to ensure that these requirements are satisfied.

Weighing Division personnel also carry out regular and special inspections of receiving and shipping scales at both terminal and transfer elevators. During the 1977-78 crop year, the Division carried out 598 inspections on 407 scales.

Plans and specifications for alterations of existing facilities or for new facilities must be examined to ensure that they are acceptable to the Commis-

sion. During the crop year, plans and specifications for 25 new, or alterations to, elevator facilities were examined.

Weighing Services. The weighing of all grain received at and shipped from licensed terminal elevators is supervised by the Weighing Division. Similar services are also provided at some licensed process elevators of the Western Division. The weighing of grain in transfer elevators is monitored on a random basis. As well, official weighing is provided on request at those facilities. Documents certifying the weight of grain are issued by the Economics and Statistics Division based on the information provided by the Weighing Division.

Appendix A provides information on the quantity of grain weighed during the 1977–78 crop year.

New Weighing Equipment. During the crop year, automatic electronic scales were installed to replace 35 manually operated mechanical scales. In addition, 14 terminal and transfer elevator scales were converted to metric units of measurement.

An agreement was signed with a terminal operator to fund the incorporation of grain weighing monitoring and data handling equipment designed to meet the Commission's specifications to be included in its modernization of grain handling and weighing facilities at two elevators located in Thunder Bay.

A contract was negotiated and signed for the development of a prototype installation to provide a proven automatic monitoring and recording system to permit development of interface specifications to become a standardized requirement for future automated grain handling systems approved for installation at terminal and transfer elevators. The project is progressing rapidly and is nearing completion.

A contract was arranged for consulting services to study the feasibility of applying the technique of closed circuit television to assist the Commission's Weighing Division staff in monitoring grain receiving and shipping systems.

Weigh-overs. All terminal and transfer elevators are regularly audited to determine whether their operations were subject to excessive overages or shortages. During the 1977–78 crop year, the audits of 14 terminal elevators and 20 transfer elevators were completed. The Economics and Statistics Division prepares summaries of weigh-over results for the review by the Commission. Where the circumstances warrant, the Commission will order the necessary remedial action to be undertaken by the licensee.

Transportation

Producer Cars. Under the terms of Section 71 of the Canada Grain Act, producers may apply to the Canadian Grain Commission for a rail car. These cars are loaded by the producer and shipped directly to terminals or other destinations, thereby bypassing the primary elevator. This option is designed to provide producers with the widest possible alternatives in handling and merchandising their grain.

The 1977–78 crop year witnessed a sizable increase in the number of

producer cars that were shipped. Where there were 255 such cars shipped during 1976-77, a total of 2,174 cars were loaded by producers during the crop year.

Research

Statistical and Economic Studies. The Economics and Statistics Division continued its regular program of studies of grain handling costs. These keep the Commission informed on the adequacy of current levels of handling and storage tariffs. In co-operation with elevator companies, the Division commenced a study of the costs of storing grain at primary elevators.

Extension of the Canada Grain Act. In co-operation with representatives of the provincial governments in Eastern Canada, the Canadian Grain Commission initiated a study on the merits of extending all sections of the Canada Grain Act to Eastern Canada.

When the Canada Grain Act was amended in 1971, Section 116(2) of the Act delayed proclamation in the Eastern Division of certain sections of the Canada Grain Act. The study will, by collecting the necessary information and canvassing all interested parties, determine whether it would be advisable for the federal government to implement the unproclaimed sections of the legislation.

During the year, Commission representatives held a number of meetings with representatives from Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island.

Canadian Government Elevators

Handlings. During the 1977-78 crop year, the Canadian Government Elevators registered a substantial increase in handlings over the preceding period. A total of 1 311 057 tonnes was received, an increase of 564 000 tonnes or 75% over the previous period's figures. Total shipments rose to 1 259 200 tonnes.

This increase in handlings was due to a number of factors. The Prince Rupert elevator was heavily utilized, reflecting the high level of exports for the period. The Canadian Government Elevators handled a considerable amount of grain screenings and bran pellets for export. As well, each terminal handled grain for the local trade; this would include grain companies, producers, grain dealers and processors. It was announced early in the crop year that, effective September 1978, Moose Jaw would become a Winnipeg Commodity Exchange futures delivery point for rapeseed and producers took early advantage of this new development. Four interior terminals are now futures delivery points and, as a result, handle substantial volumes of rapeseed delivered against futures contracts.

Wheat was the principal grain handled by the elevators and it accounted for approximately 50% of the grain handled by the five interior terminals; the other commodities handled included oats, barley, rapeseed, flaxseed, rye, corn and special crops. At Prince Rupert, on the other hand, the major commodities handled were wheat and pelleted screenings.

Elevator	Stocks	Receipts	Shipments	Stocks
	July 31, 1977			July 31, 1978
		—tonnes—		
Moose Jaw	2 880	61 793	20 837	43 836
Saskatoon	12 392	176 991	152 294	37 089
Calgary	20 908	52 420	58 690	14 638
Edmonton	1 629	69 362	61 816	9 175
Lethbridge	4 466	25 135	21 466	8 135
Prince Rupert	38 555	925 356	944 105	19 806
TOTAL	80 830	1 311 057	1 259 208	132 679

Facilities & Equipment. All electrical equipment at the Saskatoon elevator was brought up to required standard as a result of a major electrical and mechanical rehabilitation program. A similar program was started at the Lethbridge terminal. The Moose Jaw facility is the only elevator within the system yet to undergo a similar renovation. The scale automation project at Calgary, begun during the last calendar year, was completed. New reclaim systems were installed at both the Lethbridge and Saskatoon houses and improvements to the existing system at Edmonton were also completed. At the Saskatoon terminal, automatic heat sensing devices were installed to protect 28 thousand tonnes of bin capacity. Engineering work was initiated in preparation for the construction of a new dock facility and the erection of a grain drier at Prince Rupert.

Disposal. As a result of the federal government's financial restraint program announced by the Prime Minister on August 1, 1978, and following a Cabinet decision made public on September 6, 1978, the Canadian Grain Commission began the process of disposing of the six terminal elevators that comprise the Canadian Government Elevators Division. The intended privatization of the terminals is expected to increase their usefulness to the grain handling system and to reduce overall government expenditures.

The facilities were declared surplus to the Department of Public Works and that Department, through its office in Edmonton, was made responsible for their eventual disposal. The Canadian Grain Commission worked in close co-operation with departmental personnel to ensure that the shift is effected at a minimum of inconvenience and disruption to the grain handling system, the operation of the facilities, the employees concerned and the parties making use of the facilities.

Complaints

Producers' Complaints. Written and informal complaints from producers concerning matters within the jurisdiction of the Commission were investigated by the Commissioners, Assistant Commissioners or Commission personnel. The majority of the complaints were settled in a manner acceptable to the parties concerned. If and when necessary, elevator managers and company supervisors are advised concerning the resolution of specific problems of individual producers.

Cargo Shortages. Complaints about the weights of vessel shipments unloaded at transfer elevators or the outturn weights from overseas destinations are investigated by the Weighing Division. Officials of the Division investigate both the loading and unloading of the cargo wherever this is possible and provide reports to the parties concerned. The Commission also reviews information supplied by complainants on unload procedures and equipment at overseas ports.

Special Acts Administration

Grain Futures Act. The Grain Futures Act is designed to regulate all aspects of grain futures trading in Canada. Reporting to the Commission, the Supervisor of Futures Trading must ensure that the requirements of the Act are satisfied.

To do this, the Supervisor undertakes regular visits to the floor of the Winnipeg Commodity Exchange where he observes and reports on the procedures used by all those involved in futures trading. As well, he examines the records and reviews the procedures of the clearing house to ensure that these are acceptable to the Commission and in keeping with the Act. Similarly, the Vancouver Grain Exchange is visited to observe procedures used by members.

The Supervisor maintains a close liaison between the Commission and those organizations subject to the provisions of the Grain Futures Act, keeping the Commission in close touch with all of the parties concerned.

Inland Water Freight Rates Act. Under the provisions of the statute, the Commission may, if necessary, establish maximum inland water freight rates. During the year, the Commission did not find it necessary to exercise this power.

Western Grain Stabilization Act. Under Section 27(1) of the Act, the Commission may investigate, in the same manner as it investigates complaints under the Canada Grain Act, a complaint alleging that the eligibility of an applicant has not been correctly recognized. Pursuant to Section 7(2), an actual producer who is declared ineligible by the Minister may appeal the matter to the Commission and Section 28(1) grants the authority to the Commission to rule on an applicant's eligibility. During the year, one complaint was received by the Commission.

The Commission continued to provide computer services to the Western Grain Stabilization Administration; these services are essential to the maintenance of accurate records of producer transactions and levy contributions and in the calculation of payouts to eligible participants.

When the Western Grain Stabilization program was inaugurated in 1976, the Canadian Grain Commission was given the responsibility for collection of the 2% levy paid by participating producers and of the information on the sales of the major grains by all producers. In October, 1978, arrangements were made for transfer of these responsibilities to the Western Grain Stabilization Administration.

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SECTION 4—STANDARDS OF QUALITY

Grades, Grading and Inspection

Grain Standards Committees. The Eastern and Western Grain Standards Committees, composed of representatives from all segments of the grain industry, serve as the official industry forums for discussion of proposed grades and grade changes. They also meet to review and recommend primary and export standard samples to the Commission.

Two meetings were held by the Eastern Grain Standards Committee. At the September 6, 1978 meeting, held in Toronto, 11 standard samples were reviewed and recommended for approval. In addition, the members discussed the proposed changes to the barley, beans, flaxseed, oats and rye special grades. At the meeting held in Montreal, on November 2, 1978, the Committee reviewed the proposed statutory grade specifications for barley, beans, flaxseed, rye, oats and red spring wheat and recommended for approval a total of 12 standard samples.

At the Western Grain Standards Committee meeting held in Winnipeg on November 6 and 7, 1978, members discussed proposed changes to the grades of red spring wheat, utility wheat, flaxseed, barley, rye, beans, domestic mustard seed and oats and to the export standard specifications for red spring wheat and utility wheat. The Committee also recommended for approval a total of 32 standard samples and 9 export standard samples for the 1978-79 crop year.

The membership of both Committees is listed in Appendix B of this report.

Grading Services to Producers. Producers dissatisfied with the grade or dockage content assessed upon their grain when it is delivered to a primary elevator, may request that a representative portion of the sample taken at unload be forwarded to the Inspection Division as "Subject to Inspector's Grade and Dockage". A similar service is provided for samples forwarded to the Division for determination of moisture content. As well, the Division will inspect, as a free service, any samples forwarded directly to the Commission by producers.

During 1977-78, Division personnel inspected a total of 50,785 "Subject to Inspector's Grade and Dockage" and other unofficial samples, including 40,665 from Western Canada and 10,120 from Eastern Canada.

The Chief Grain Inspector investigated 21 producer complaints about special bin carlot shipments from primary elevators. He determined that, in five cases, the identity had not been preserved by the primary elevator.

Inspection Services at Terminal, Transfer and Process Elevators. All grain received at and shipped from licensed terminal elevators in the Western Division is sampled and graded by the Inspection Division. All Canadian grain discharged from licensed transfer elevators onto vessels for export overseas is sampled and graded. Cargoes of eastern and western grain received at transfer elevators may be checked upon receipt; full inspection will be provided if a request to do so is received or if the grain has not yet been officially inspected. Canadian grain shipped out of the transfer elevators for domestic

utilization is inspected upon request. Sampling and inspection services are provided on a request basis to process elevators. All grain in store at the terminal and transfer facilities will be inspected at the official weigh-over of stocks.

The Inspection Division issues certificates or letters on all grades that are established by its inspectors and issues the Certificate Final on export shipments of Canadian grain and oilseeds.

New Equipment. On February 1, 1978, the conversion to the metric system of measurement was completed; this involved the purchasing and modification of scales and balances, thermometers, sieves and other inspection laboratory equipment. All Model 919 moisture meters were transistorized and a large majority converted to 3.5-inch cell size from 3-inch for greater accuracy and reduced maintenance costs.

Ten new single celled electronic protein testing instruments were purchased for the expansion of the protein segregation program of red spring wheat at terminal elevators.

Pneumatic sample transport systems were installed in several terminal and transfer elevators to provide more efficient Inspection Division services.

New accommodations and offices were completed to accommodate the supervisory, protein testing and entomology services and operations maintenance requirements at Vancouver.

Grain Appeal Tribunal. A total of 546 appeals were dealt with by the Grain Appeal Tribunal at Winnipeg, during the 1977-78 crop year. This is a substantial increase over the previous year's total of 224. The grades were sustained in 485 cases; this represents 88.9% of the total number appealed. All grades related to the grades assessed when grain delivered by car or truck lot was officially inspected upon unload in the Western Division. Most of the appeals concerned either wheat, barley or rapeseed.

Quality of Export Shipments. The Inspection Division and the Grain Research Laboratory carried out investigations whenever inquiries were received from overseas relating to the quality of individual export cargoes. Official loading samples of the shipments were studied and tested. Affected parties were provided with detailed reports.

Quality Control

Variety Testing. Four thousand samples of barley and wheat received from plant breeders were examined by the Inspection Division for an assessment of their visual characteristics. These included a total of 79 varieties of spring and winter barley and 46 varieties of wheat grown in the 1977 eastern and western co-operative variety tests.

New cultivars of red spring and amber durum wheat and malting barley developed by plant breeders as potential grains of commerce for Western Canada, and grown in the annual co-operative tests are subjected to detailed quality evaluation each year in the Grain Research Laboratory. Early in 1978, tests were carried out on 36 cultivars of red spring wheat, 74 cultivars of amber durum wheat and 108 cultivars of barley. In addition, pilot scale malting tests were carried out on 35 barley cultivars in advanced stages of quality testing.

Protein Segregation of Wheat. The 1977-78 crop year was the first year in which the protein segregation program of red spring wheat at licensed terminal elevators was carried out using on-the-spot, electronic protein testing equipment.

Cargo shipments consistently satisfied export protein requirements and no formal complaints relating to guaranteed protein levels were received from overseas buyers.

The Commission continued its program of testing and evaluating protein determination equipment. One single-celled electronic near infrared spectroscopy instrument and a semi-automated chemical system were tested.

As part of the experimental high-protein wheat program, the Commission established two special grades of Canada Western Red Spring Wheat. Producers who deliver red spring wheat of minimum 15% protein to primary elevators are eligible to receive this grade and the direct payment of a protein premium. They may also request that the Commission review the protein content determined by the primary elevator operator.

The Commission assisted grain handling firms in developing a protein segregation system for primary elevators. Each major grain company was loaned a single celled electronic protein testing instrument for testing the protein content of advance and producer delivery samples at selected locations. The data which will be provided from this experiment will be used to further refine the primary elevator protein segregation system.

Entomology Services. The Inspection Division's Entomology Section processed in excess of 68,000 samples, slightly more than the previous crop year. Of these, 956 or 1.4% were discovered to be infested; 306 of the infested samples had originated from terminal elevators, 302 from primary elevators and 287 from carlots.

The rusty grain beetle accounted for the majority of intercepted infestations; the red flour beetle, granary weevil and saw toothed grain beetle were also discovered. A sample from a Manitoba feed mill was also found to contain the lesser grain borer. This species is not found in Canada and it is felt that the infestation originated from U.S. corn that had been imported into Canada; subsequent sampling and testing revealed no further infestations.

An increase in the level of infestation had been expected as a result of the heavy rainfall in Manitoba and Saskatchewan during the 1977 harvest. This resulted in the harvesting and storage of a sizeable quantity of tough, lower quality grains and oilseeds. The expected infestations did not materialize until June of 1978, mostly because the grain had been stored under cool conditions and because the lower quality material did not start moving off farms until the latter period of the crop year.

The West Coast experienced an increase in infested deliveries and stocks early in the crop year, but the incidence decreased during the latter part of the year.

The level of infestation in Thunder Bay elevators remained relatively low until the last portion of the crop year. This was mostly due to the increase in lower quality material being originated from the country. An excellent sanitation program in the terminal helped to reduce the incidence of infested grains.

During the crop year, samples were received from 793 primary elevators. Only 116 elevators were temporarily held for examination of infestation levels and two elevator licences were suspended.

The Commission continued its extension program on the detection and control of insects. These included presentations and lectures to primary and terminal elevator operators across the Prairies, in Ontario and in Quebec.

In addition, the Commission has begun the process of setting up a grain sanitation laboratory to service the St. Lawrence and Maritime ports.

Grain Drying. The inclement wet weather conditions during the 1977 harvest in both eastern and western Canada resulted in the artificial drying of a large portion of the crops to prevent deterioration in storage. A total of 1 077 826 tonnes of high moisture grain were artificially dried in terminal elevators, compared to about 381 000 tonnes that were dried during the 1976-77 crop year. The artificial drying of grain in terminal elevators is done under the supervision of the Commission's Inspection Division.

Monitoring Moisture Meter Performance. A bi-weekly check test program is maintained by the Research Laboratory to monitor the performance of all Model 919 moisture meters used by the Grain Inspection Division and by the Government Elevators Division in their offices across Canada. The Research Laboratory services and repairs meters as required.

For many years, two versions of the Model 919 moisture meter have been used by the Commission. In Western Canada where the grain crops were predominantly small-seeded types, meters were equipped with 3-inch measuring cells. In Eastern Canada, meters were equipped with 3½-inch cells in order to accommodate large-seeded grains like corn and soybeans. This past year the Commission embarked on a program to convert all 3-inch cell meters into 3½-inch cell units. This was prompted in part by a diversification in western Canadian agriculture involving progressively increasing production of large-seeded grains. A second meter conversion was carried out simultaneously involving the transistorization of all of the older tube-type Model 919 moisture meters.

Pesticide Residue Monitoring. Exports of Canadian wheat, barley, oats and rye are examined in a continuing program to check for residues of organochlorine and organophosphate pesticide treatment chemicals. During the crop year, 1,924 cargoes were examined. In addition, at the request of the Grain Inspection Division, 251 carlot samples of grain were screened for pesticide residues.

Monitoring of Rapeseed Quality. The Research Laboratory maintains a continuing program to monitor both domestic railway carlots and the cargo export movement of rapeseed to obtain data on oil content, erucic acid content, chlorophyll content and glucosinolate content of the seed. The Commission provides the quality data for cargo export shipments to the oilseed industry each month.

Research

Laboratory Research. Milling research has included: (1) studies of the effect of feed rate on grinding efficiency, (2) a short method of producing straight grade flour, (3) methods of improving flour extraction with some soft

wheat varieties, and (4) a Laboratory method for dehulling fababeans to produce a husk-free product of uniform particle size.

A comparison of flour products from the pilot mill with those from two commercial flour mills has provided information for modifications to the pilot mill and guidelines for further comparison studies. Other investigations with the pilot mill included studies of the effect of varying release on the first break rolls and comparison of different flour sieve sizes. An experimental flour rebolter has been developed and introduced into the pilot mill operation.

The effects of oxidation and intermediate proof on work requirements for optimum short-process bread were studied. The best bread is obtained when an optimum level of chemical oxidation is used in doughs mixed to peak consistency. In the absence of added oxidation, doughs must be mixed using some 3 to 5 times the work required to achieve maximum consistency in order to obtain satisfactory bread. Intermediate proof requirements are greater in the absence of added oxidation.

A Laboratory wheat identification scheme has been set up which uses polyacrylamide gel electrophoresis to produce a "fingerprint"—a stained pattern of wheat gliadin proteins—which is characteristic for a given wheat cultivar. This scheme can be used in conjunction with visual identification to ensure that only licensed wheat varieties enter top grades.

The amount of insoluble protein of 36 cultivars of Canada red spring wheat has been determined. Significant correlations have been found between insoluble gluten in content and loaf volume, extensigraph area and mixing time. In another study gluten isolated from a hybrid spring wheat variety has been fractionated into acid-soluble and insoluble fractions. Reconstitution by adding these fractions to base flours has shown the acetic acid soluble fraction enhances baking quality while the highly insoluble gluten fraction is detrimental to baking quality.

On behalf of the International Association for Cereal Chemistry (ICC), the Laboratory organized collaborative tests of the ICC draft standard baking method.

Research on durum wheat included a study of the effect of extraction rate during milling on semolina properties, pasta-processing characteristics and spaghetti-cooking quality. Pigment lost during processing increased with increasing semolina extraction but spaghetti cooking quality was not changed. On the basis of this study the durum milling procedure has been adjusted to produce a more granular 70% extraction semolina (up from 58%), comparable to commercial semolina. In another study, the farinograph mixer was used to prepare pasta doughs at 30° C and 50° C with water content ranging from normal pasta dough levels up to bread dough levels. For a series of wheats with varying gluten strength, weak wheats achieved gluten development at lower dough water content than strong gluten wheats.

Studies of the amylase enzymes are dominant in the barley research program. Methods for extracting maximum amounts of alpha-amylase from barley and malted barley are being investigated. A "new" amylase in barley reported but not identified by Finnish workers has been isolated, purified and characterized using ion exchange chromatography, isoelectric focusing, immunochemistry and paper chromatography.

The synthesis of beta-amylase enzymes and their modification during germination or malting was studied. The beta-amylase patterns of barley and malt produced by isoelectric focusing may be useful as physiological

markers for variety identification. Other work on barley included the evaluation of a number of analytical methods as additions to or replacements for existing standard methods for the evaluation of malting quality of plant breeders' cultivars. The tests included the determination of specific gravity of malt extract and of beer to replace standard photometric methods. Further work has been conducted on the determination of barley polyphenolic content as an index of beer quality. Also a study of factors involved in the inhibition of germination of barley due to water-sensitivity was completed.

Oilseed research included a preliminary study of the chemical and physical properties of heat-damaged rapeseed. Initial results showed a high correlation between heated-seed content and the color of the oil-free meal. A survey carried out by the Laboratory and the Department of Plant Science, University of Manitoba, of the sulphur content of oil from both high and low-glucosinolate rapeseed showed a wide variation in sulphur content of oil extracted from low-glucosinolate seed at different crushing plants. The sulphur content of oil from low-glucosinolate seed was only 50% of the sulphur content of oil from high-glucosinolate seed processed at the same plant. Refining and bleaching did not significantly reduce the sulphur level of oil from low-glucosinolate seed from the level in the crude degummed oil.

Unfavourable weather during the 1977 harvest resulted in water entering the capsules of ripening flax, disrupting the surface mucilage of the seed. This phenomenon was studied jointly by the Laboratory and the Agriculture Canada Research Station at Morden and indicated a reduction in seed mucilage and a reduction in the sedimentation value of the meal. These factors were not of sufficient importance to warrant further degrading of the flaxseed on account of the weathering.

The pesticide residue section of the Laboratory improved the previously reported analytical method for phosphine in wheat to include screening for residues of carbon tetrachloride, carbon disulphide and ethylene dibromide.

A more detailed description of the research activities is given in the Annual Report published by the Grain Research Laboratory.

Statistical and Economic Studies. The Economics and Statistics Division collaborated with the Canadian Wheat Board and elevator licensees in a number of statistical and economic research projects examining the advantages and disadvantages of extending the identification and segregation of 1 C.W.R.S. and 2 C.W.R.S. wheat by protein content to primary elevators. Evaluations of alternate protein identification systems or configurations for primary elevators from the viewpoint of technical efficiency and overall costs, were the preliminary foci of these studies. Quantitative assessments of the potential benefits of protein segregation in the country have been developed as well as a preliminary analysis of the costs and risks to the present export program for 1 C.W.R.S. and 2 C.W.R.S. wheat of guaranteed protein content. The Division is represented on a sub-committee of the Canadian Wheat Board's Grain Transportation Technical Group which began studying this subject during the crop year.



SECTION 5—ADMINISTRATION

Personnel

Retirements and Staffing. Personnel services relating to the Canadian Grain Commission were provided by the Personnel Administration Branch of Agriculture Canada.

Dr. G. N. Irvine, Director of the Commission's Grain Research Laboratory, retired in December, 1978.

The Weighing Division increased the staff in its Montreal office by 10 persons. This will allow the Division to better serve the requirements of transfer elevators located on the St. Lawrence.

Awards. During 1978, Dr. G. N. Irvine, Chief Chemist of the Commission, was awarded the M. B. Neumann Award of the Association for Cereal Research at a meeting of the Association held in Germany. He was also presented with the William F. Geddes Memorial Award by the American Association of Cereal Chemists at the Sixth International Cereal and Bread Congress held in Winnipeg.

Dr. K. H. Tipples and Mr. H. Kilborn, members of the Grain Research Laboratory staff, were joint recipients of the Carl Wilhelm Brabender Award for 1978 which was presented to them at the Cereal and Bread Congress.

Information

Publications. Throughout the crop year the Research Laboratory published and distributed its continuing series of quarterly bulletins detailing the quality of export shipments of red spring wheat and amber durum wheat. In addition, information on the oil content, protein content and erucic acid content of rapeseed cargoes was provided each month to the grain trade.

Following the 1978 harvest the Research Laboratory published and distributed the 1978 red spring wheat protein maps and crop bulletins on the Western Canada crops of red spring wheat, amber durum wheat, barley, flaxseed and rapeseed. Information on the crops of Eastern white winter wheat was also obtained and distributed.

Members of the staff of the Research Laboratory published 16 scientific and technical papers in six different journals.

The Economics and Statistics Division regularly published and distributed statistics on grain moving through the licensed elevator system to domestic and export markets.

All publications issued by the Commission are listed in Appendix C of this report.

Meetings. Several members of the Laboratory's staff served as chairmen of committees involved in organizing the Sixth International Cereal and Bread Congress held in Winnipeg in September, 1978.

Professional and technical staff of the Grain Research Laboratory represented the Commission at nine scientific and technical conferences in North America and two in overseas countries.

As well, the Commissioners and senior officials of the Commission attended and addressed a variety of meetings in Canada of organizations involved in the grains industry to publicize the activities of the Commission, to explain Commission policies and to discuss subjects of current interest.

Foreign Visits. During the year, the Commission and its representatives visited the United Kingdom, Japan, West Germany, Belgium, Hong Kong, the United States, Cuba, France, the U.S.S.R., The Netherlands and Vietnam.

In the course of those visits, they met with purchasers, processors, importers, researchers and government representatives to discuss the quality of the 1977-78 crop of Canadian grain and oilseeds, and the handling, transportation, treatment and processing of grain.

Tours. The head office of the Commission and offices outside Winnipeg were visited by individuals, officials, groups, delegations or missions from Japan, the U.S.S.R., India, Bangladesh, France, Belgium, Turkey, China, Australia, Ireland, the United States, West Germany, Cuba, the United Kingdom, Peru. Tours were also provided to Canadian producers, grain company employees, government employees, students, journalists, trade commissioners, scientists, purchasers and processors. Participants of the Canadian International Grains Institute's courses also toured Commission facilities.

During the Sixth International Cereal and Bread Congress, nearly 265 persons visited the Commission facilities in Winnipeg.

Canadian International Grains Institute. Commission employees serve as lecturers and resource persons on the courses and special programs offered by the Institute. As well, Commission facilities were made available for tours and demonstrations. Mr. G. G. Leith and Mr. E. E. Baxter are members of the Board of Directors of the Institute.

Finances

Revenues. During the fiscal period ending March 31, 1978, the Commission collected \$18,745,000 in revenues. This represents an increase of \$3,020,000 or 19.2% over the previous year's returns. These funds were generated, in part, by the fees charged for services provided by the Inspection, Weighing and Economics and Statistics Divisions. The revenues of the Canadian Government Elevators increased by \$653,000, mostly because of the higher volume of grain handled by the terminals.

Expenditures. Commission expenditures rose to \$28,048,000 during the same period, an increase of 2.5% over the preceding fiscal year. Operating and maintenance costs totalled \$25,262,000. Increased personnel, duty travel and utility costs and higher grants in lieu of taxes were the principal reasons for the \$1,482,000 or 6.2% increase over 1976-77. Capital expenditures on the other hand fell to \$2,784,000, a decrease of \$802,000. This was due to the completion of a number of capital intensive projects, including the completed installation of pollution control equipment at the Prince Rupert terminal.



APPENDIX A—GRAIN STATISTICS AND QUALITY

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A-1—Supply and Disposition of Canadian Grains, Crop Year 1977-78*

	Wheat**	Oats	Barley	Rye	Flaxseed	Rapeseed	Totals
	—in thousands of tonnes—						
SUPPLY							
Carry-over July 31, 1977	13 318	1 328	3 218	347	212	199	18 622
Production in 1977	19 862	4 303	11 799	407	650	1 973	38 994
Imports	—	—	—	—	—	—	—
Total Supply	33 180	5 631	15 017	754	862	2 172	57 616
DISPOSITION							
Exports***	16 000	90	3 435	271	253	1 014	21 063
Domestic Use	4 792	3 826	6 264	195	128	833	16 038
Total Disposition	20 792	3 916	9 699	466	381	1 847	37 101
CARRY-OVER (July 31, 1978)							
On Farms (Estimated)	5 280	1 234	3 222	76	114	34	9 960
In primary, process and terminal elevators	5 205	412	1 776	201	343	276	8 213
In store and afloat to eastern transfer elevators . . .	1 155	45	147	3	5	—	1 355
In eastern & western mills	101	9	—	—	—	—	110
In transit by rail, eastern and western divisions	647	15	173	8	19	15	877
Total in store July 31, 1978	12 388	1 715	5 318	288	481	325	20 515

* Subject to revision
** Wheat includes Durum Wheat
*** Includes exports of bulk grain, seeds, and (except for flaxseed and rapeseed) milled and processed products expressed as grain equivalent.

A-2—Licences in Force and Storage Capacity, August 1, 1977 and 1978

Type of Licence	Licences in force August 1,		Licenced storage capacity August 1,	
	1977	1978	1977	1978
	—tonnes—			
Primary Elevator	3 739	3 658	9 316 080	9 245 450
Terminal and Process Elevator	55	54	4 231 830	4 127 210
Transfer Elevators	27	27	3 425 720	3 485 370
Grain Dealers*	30	39	—	—
Totals	3 851	3 778	16 973 630	16 858 030

* These licences do not cover grain storage facilities.

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1977-78

Grade	Carlots	Percentage	Percentage of total wheat inspected
WHEAT			
1 Canada Western Red Spring	124,397	54.5	—
Tough 1 Canada Western Red Spring	256	.1	—
2 Canada Western Red Spring	28,555	12.5	—
Tough 2 Canada Western Red Spring	1,441	.6	—
3 Canada Western Red Spring	40,056	17.5	—
Tough 3 Canada Western Red Spring	12,177	5.3	—
1 Canada Utility	4,373	1.9	—
2 Canada Utility	1,319	.6	—
3 Canada Utility	6,910	3.0	—
Tough Others	8,505	3.7	—
Damp	410	.2	—
Rejected	27	.1	—
Others red spring	—	—	—
Total red spring wheat	228,426	100.0	87.2
1 Canada Western Amber Durum	14,739	50.6	—
2 Canada Western Amber Durum	9,650	33.2	—
3 Canada Western Amber Durum	3,161	10.9	—
4 Canada Western Amber Durum	1,030	3.5	—
5 Canada Western Amber Durum	129	.4	—
Tough durum	256	.9	—
Others durum	141	.5	—
Total amber durum wheat	29,106	100.0	11.1
Total soft white spring	1,900	43.6	.7
Total red winter wheat	2,461	56.4	1.0
Total all wheats	261,893	100.0	100.0

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1977-78 (Continued)

Grade	Carlots	Percentage
OATS		
1 Canada Western	26	.3
2 Canada Western	1,160	14.5
Extra 1 Feed	470	5.9
1 Feed	5,004	62.6
2 Feed	710	8.9
3 Feed	79	1.0
Tough	444	5.6
Damp	7	—
Rejected	2	—
Others	98	1.2
Total oats	8,000	100.0
BARLEY		
1 Canada Western Six-Row	72	.1
2 Canada Western Six-Row	6,721	8.7
1 Canada Western Two-Row	132	.2
2 Canada Western Two-Row	3,207	4.2
1 Feed	47,767	62.0
2 Feed	5,669	7.4
3 Feed	567	.7
Tough	12,056	15.6
Damp	434	.6
Rejected	105	.1
Others	298	.4
Total barley	77,028	100.0

**A-3—Inward Carlot Inspections of Western Grain, Crop Year 1977-78
(Continued)**

Grade	Carlots	Percentage
RYE		
1 Canada Western	2,121	59.0
2 Canada Western	997	27.8
3 Canada Western	294	8.2
Ergoty	7	.2
Tough	138	3.8
Others	36	1.0
Total rye	3,593	100.0
FLAXSEED		
1 Canada Western	4,900	92.3
2 Canada Western	218	4.1
3 Canada Western	64	1.2
4 Canada Western	14	.3
Tough	81	1.5
Rejected	23	.4
Others	12	.2
Total flaxseed	5,312	100.0
RAPESEED		
1 Canada	16,932	94.5
2 Canada	709	4.0
3 Canada	106	.6
Others	177	.9
Total rapeseed	17,924	100.0

A-3—Inward Carlot Inspections of Western Grain, Crop Year 1977-78 (Concluded)

Grade	Carlots	Percentage
OTHER GRAINS		
Malt Barley	2	—
Corn	—	—
Sunflower seed	1,233	26.1
Mixed grain	212	4.5
Screenings	500	10.6
Buckwheat	451	9.6
Peas	159	3.4
Sample grain	3	.1
Mustard seed	634	13.4
Condemned grain	93	2.0
Canary seed	15	.3
Faba beans	16	.3
Screening pellets	1,401	29.7
Triticale	1	—
	4,720	100.0
Grand Total	378,470	

A-4—Samples of Western Grain “Subject to Grade and Dockage” and Other Unofficial Samples Inspected, Crop Year 1977-78 Compared with Crop Year 1976-77

Point	1977-78	1976-77
	Number of Samples	
Winnipeg	15,916	16,792
Calgary	2,199	6,774
Edmonton	1,859	2,198
Moose Jaw	256	159
Saskatoon	2,203	151
Lethbridge	14,018	10,522
Vancouver	4,214	2,859
Totals	40,665	39,455

A-5—Unofficial Samples of Eastern Grain Inspected, Crop Year 1977-78

Point	1976-77	1977-78
	Number of Samples	Number of Samples
Chatham	8,130	9,691
Toronto	840	174
Montreal	113	255
Totals	9,083	10,120

A-6—Inward Carlot and Trucklot Re-inspections of Western Grain, Crop Year 1977-78

Point	Inspected	Re- Inspected	Un- changed	Grades raised	Grades lowered	Dockage raised	Dockage lowered
Thunder Bay	219,253	14,834	13,623	1,100	75	8	28
Winnipeg	6,034	874	697	144	13	14	6
Churchill	14,294	418	309	103	4	—	2
Moose Jaw	1,918	37	33	3	—	—	1
Saskatoon	7,970	528	435	72	9	6	6
Calgary	5,472	444	431	12	—	1	—
Edmonton	3,198	193	171	19	—	1	2
Lethbridge	1,249	4	4	—	—	—	—
Prince Rupert	15,756	409	395	14	—	—	—
Vancouver	119,171	5,317	4,995	249	15	8	50
Totals	394,315	23,058	21,093	1,716	116	38	95
Percentage of total carlots and trucklots ...	100.0	5.8	5.3	.4	*	*	*

* Less than 0.05%

A-7—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1977-78

Grain	Winnipeg	Thunder Bay	Calgary	Edmonton	Moose Jaw
Wheat	19	6,136	81	80	141
Oats	143	1,476	1	90	2
Barley	146	3,157	193	50	—
Flaxseed	—	15	16	24	124
Rye	1	80	4	2	—
Mixed Grain	20	15	4	12	2
Corn	—	—	—	—	—
Buckwheat	—	4	—	—	—
Peas	13	—	—	—	—
Screenings	123	1,282	112	270	44
Rapeseed	—	24	250	673	8
Sample feed grain	—	—	—	—	—
Mustard seed	—	14	—	—	187
Sample grain	—	64	—	—	—
Sunflower	—	8	—	—	1
Canary seed	—	—	—	—	—
Broken wheat	3	—	—	—	—
Different grain	1	—	—	16	18
Pellets	—	—	—	2	—
Beans	2	—	—	18	—
Sample broken grain	10	—	1	—	—
Totals	481	12,275	662	1,237	527

**A-7—Outward Carlot Inspections of Western Grain at Terminal and Process Elevators, Crop Year 1977-78
(Continued)**

Grain	Saskatoon	Lethbridge	Vancouver and Prince Rupert	Churchill
Wheat	56	66	204	—
Oats	171	7	1,171	—
Barley	48	79	59	—
Flaxseed	29	3	16	—
Rye	3	37	6	—
Mixed grain	—	—	37	—
Corn	—	77	—	—
Buckwheat	—	—	10	—
Peas	353	1	—	—
Screenings	1,867	11	2,071	109
Rapeseed	—	56	7	—
Sample feed grain	—	—	1	—
Mustard seed	192	128	—	—
Sample grain	—	—	—	—
Different grain	4	—	—	—
Sunflower	—	—	—	—
Beans	—	11	—	—
Broken wheat	—	—	4	—
Pellets	—	—	230	—
Totals	2,723	476	3,816	109

A-8—Carlot Inspections of Eastern Grain, Crop Year 1977-78

Grade	Montreal	Toronto	Chatham	Total
WHEAT				
2 Canada Eastern White Winter	—	—	101	101
3 Canada Eastern White Winter	—	—	3	3
Sample Canada Eastern White Winter	—	—	1	1
Totals	—	—	105	105
RYE				
Tough	—	—	1	1
Totals	—	—	1	1
CORN				
1 Canada Eastern Yellow	7	—	23	30
2 Canada Eastern Yellow	236	—	82	318
3 Canada Eastern Yellow	114	—	4	118
4 Canada Eastern Yellow	26	—	1	27
5 Canada Eastern Yellow	9	—	—	9
Totals	392	—	110	502
SOYBEANS				
1 Canada Yellow	8	—	2	10
2 Canada Yellow	15	3	5	23
3 Canada Yellow	1	—	—	1
Tough	—	—	7	7
Moist	—	—	1	1
Totals	24	3	15	42
Totals, all grains	416	3	231	650

A-9—Inspections of Eastern Grain in Cargoes, Bins, Trucks or Warehouses, Crop Year 1977-78

Grain	Montreal	Toronto	Chatham	Total
—tonnes—				
Wheat	—	—	61 063	61 063
Domestic Mustard Seed	—	—	—	—
Corn	9 469	—	360 087	369 556
Soybeans	—	—	21 884	21 884
Beans	—	—	1 695	1 695
Totals	9 469	—	444 729	454 198

A-10—Inward and Export Cargoes Sampled and Inspected, Crop Year 1977-78

	Montreal	Sorel	Three Rivers	Quebec	Halifax and Saint John	Baie Comeau	Port Cartier	Total
	—tonnes—							
Eastern Grain								
Inward	6 881	—	—	14 631	—	5 121	—	26 633
Export	106 248	12 828	10 500	—	53 914	157 789	99 798	441 077
Western Grain								
Inward	67 031	—	—	10 174	—	—	23 811	101 016
Export	675 999	523 706	121 914	1 085 191	453 975	586 322	616 945	4 064 052
Totals	856 159	536 534	132 414	1 109 996	507 889	749 232	740 554	4 632 778

A-11—Grain Sampled but not Inspected, Crop Year 1977-78

	Montreal	Toronto and Chatham	Sorel Quebec and Three Rivers	Halifax and St. John	Baie Comeau	Port Cartier	Total
Eastern Grain							
Carlots.....	1,911	—	—	—	—	—	1,911
Inward cargoes (tonnes)	34 598	—	—	—	—	—	34 598
Outward cargoes (tonnes)	—	—	—	—	—	—	—
Bin lots (tonnes)	—	—	—	—	—	—	—
Western Grain							
Carlots.....	178	—	—	—	—	—	178
Inward cargoes (tonnes)	53 759	—	—	—	—	—	53 759
Outward cargoes (tonnes)	—	—	—	—	—	—	—
Bin lots (tonnes)	—	—	—	—	—	—	—
U.S.A. Grain							
Carlots.....	—	—	—	—	—	—	—
Inward cargoes (tonnes)	13 110	—	46 860	—	—	24 272	84 243
Outward cargoes (tonnes)	2 570	—	409 126	—	45 614	342 802	800 111
Bin lots (tonnes)	—	—	—	—	—	—	—
Totals—cars	2,089	—	—	—	—	—	2,089
—tonnes	104 037	—	455 986	—	45 614	367 074	972 711

A-12—Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1977-78

Point	Wheat	Durum	Oats	Barley	Rye	Flaxseed
RECEIPTS						
—tonnes—						
Thunder Bay	8 202 002	1 604 863	421 133	2 935 142	99 269	214 204
Vancouver	4 935 275	314 050	3 362	1 228 668	140 239	109 447
Prince Rupert	840 637	—	—	140	—	—
Churchill	704 109	—	—	29 674	—	—
Calgary	3 173	119	212	24 579	99	1 127
Edmonton	3 445	60	1 578	5 090	102	2 236
Lethbridge	3 841	—	580	3 785	3 095	291
Moose Jaw	10 237	5 640	—	981	365	38 314
Saskatoon	8 940	251	634	10 788	—	6 878
Totals	14 711 659	1 924 983	427 499	4 238 847	243 169	372 497
SHIPMENTS						
—tonnes—						
Thunder Bay	7 783 262	1 665 974	433 972	2 927 427	143 374	189 015
Vancouver	4 918 997	310 718	5 167	1 206 672	138 331	100 852
Prince Rupert	837 113	—	—	140	—	—
Churchill	666 222	—	—	25 773	—	—
Calgary	7 178	119	15	27 477	408	989
Edmonton	3 301	60	847	2 521	102	1 771
Lethbridge	3 729	—	318	3 897	2 866	222
Moose Jaw	244	3 533	—	—	—	6 875
Saskatoon	4 240	251	2 609	2 426	—	2 291
Totals	14 224 286	1 980 655	442 928	4 196 333	285 081	302 015

**A-12—Gross Quantities of Grain Inspected and Weighed at Terminal Elevators, Crop Year 1977-78
(Continued)**

Point	Rapeseed	Mustard Seed	Buckwheat	Peas	Miscellaneous
RECEIPTS					
			—tonnes—		
Thunder Bay	73 610	33 455	1 125	9 036	48 983
Vancouver	1 020 665	—	22 711	—	223
Prince Rupert	—	—	—	—	424
Churchill	—	—	—	—	—
Calgary	24 422	89	—	—	—
Edmonton	56 467	—	—	—	965
Lethbridge	7 264	2 518	—	—	2 558
Moose Jaw	611	9 939	—	—	50
Saskatoon	147 352	6 489	—	—	239
Total	1 330 391	52 490	23 836	9 036	53 442
SHIPMENTS					
			—tonnes—		
Thunder Bay	82 761	32 025	1 117	9 258	46 196
Vancouver	933 026	—	22 023	—	23
Prince Rupert	—	—	—	—	269
Churchill	—	—	—	—	—
Calgary	21 501	48	—	—	40
Edmonton	48 741	—	—	—	1 154
Lethbridge	4 312	1 679	—	—	3 104
Moose Jaw	218	8 705	—	—	41
Saskatoon	128 528	5 434	—	—	108
Totals	1 219 087	47 891	23 140	9 258	50 935

N.B. Miscellaneous includes Sunflower Seed, Mixed Grain, Sample Feed Grain, Canary Seed, Triticale, Faba Beans, U.S. Corn, Corn, U.S. Mustard Seed.
This statement does not include Barley Malt.

**A-13—Carlots Weighed and Exception Reports Issued
in the Western Division, Crop Years 1977-78 and 1976-77**

	1977-78	1976-77
Cars Weighed In	372,054	353,740
Cars Weighed Out	13,862	13,933
Exception Reports Issued*	11.730	17.039

* Represents leaks and missing or defective seals.

**A-14—Average Reported Outturn Shortage on Vessel Shipments of Grain
from Thunder Bay to Licensed Transfer Elevators, Crop Year 1977-78**

Grain	Tonnes Shipped	Shortage per 1000 tonnes	
		1977-78	1976-77
Wheat	7 263 730	.624	.726
Durum Wheat	1 534 126	.545	.760
Oats	311 839	.935	.778
Barley	2 310 267	.932	.456
Rye	24 378	.176 ²	1.410
Flaxseed	36 581	1.297	.677
Rapeseed	—	—	—
Peas	9 257	1.230	1.113
Screenings	67 551	.866	1.016

² Overage

A-15—Tough and Damp Grain Dried by Storage Position, Crop Year 1977-78

	Artificial Drying				
Point	Tough	Damp	Tough and Damp	Natural Drying	Totals
	—tonnes—				
Thunder Bay					
Wheat	362 578	14 483	377 061	160 688	537 749
Durum	—	252	252	11 807	12 059
Oats	219	89	308	15 019	15 327
Barley	101 743	12 891	114 634	146 362	260 996
Rye	—	—	—	1 911	1 911
Flaxseed	—	5	5	2 852	2 857
Rapeseed	—	—	—	194	194
Sunflower Seed	1 612	38	1 650	946	2 596
Buckwheat	145	—	145	312	457
Totals	466 297	27 758	494 055	340 091	834 146
Pacific Coast					
Wheat	360 119	7 659	367 778	124 605	492 383
Durum	—	—	—	732	732
Barley	183 641	9 729	193 370	27 810	221 180
Rye	—	—	—	2 469	2 469
Flaxseed	—	—	—	750	750
Rapeseed	—	—	—	1 430	1 430
Buckwheat	2 199	124	2 323	694	3 017
Totals	545 959	17 512	563 471	158 490	721 961
Interiors*					
Wheat	1 687	1 094	2 781	18	2 799
Durum	242	108	350	—	350
Oats	184	—	184	—	184
Barley	3 042	1 017	4 059	83	4 142
Rye	—	69	69	—	69
Flaxseed	1 288	1 140	2 428	108	2 536
Rapeseed	6 756	3 646	10 402	933	11 335
Corn	—	—	—	—	—
Mustard Seed	—	—	—	14	14
Faba Beans	—	27	27	—	27
Totals	13 199	7 101	20 300	1 156	21 456
Churchill					
Wheat	—	—	—	1 128	1 128
Totals—All Postions	1 025 455	52 371	1 077 826	500 865	1 578 691

* N.B. —Interiors—The following Special Bin figures not included in above totals.

Wheat 27 tonnes
Oats 8 tonnes
Flaxseed 4 tonnes
Rapeseed 4 tonnes
Corn 136 tonnes
Mustard Seed 70 tonnes
Faba Beans 2 tonnes

A-16—Quality Data for Grades of Red Spring Wheat Exported, Crop Year 1977-78

	1 C.W. Red Spring				2 C.W. Red Spring				3 C.W. Red Spring
	13.5	13.0	12.5	11.5	13.5	12.5	11.5	*	
Test weight, kg/hl	80.2	80.0	80.2	80.5	79.1	79.2	79.0	77.2	
1000kernel weight, g	31.7	31.6	32.2	31.9	32.2	32.1	31.8	33.3	
Wheat protein content, %**	13.7	13.1	12.8	11.9	13.5	12.9	11.9	12.7	
Falling number, sec	385	475	400	400	315	365	375	245	
Flour protein content, %***	13.1	12.4	12.0	11.4	13.0	12.2	11.2	11.6	
Flour yield, %	75.2	74.7	75.5	74.9	74.5	74.4	74.7	72.7	
Flour ash content, %	0.45	0.45	0.47	0.47	0.43	0.44	0.45	0.45	
Baking absorption, %	64	62	62	61	63	62	60	63	
Loaf volume, cc	850	815	780	735	845	805	735	750	

* Not segregated by protein content

** 13.5% moisture basis

*** 14.0% moisture basis

A-17—Official Inspections Appealed, Crop Year 1977-78

Item	Carlots	Percentage
Left as graded	485	88.9
Grades raised	57	10.4
Grades lowered	4	0.7
Totals	546	100.0

A-18—Weighted Average Lake Freight Rates on Canadian Grain from Thunder Bay, Season of Navigation 1978*

Port of Discharge	Wheat	Oats	Barley	Rye	Flaxseed	Rapeseed
—dollars per tonne—						
Georgian Bay Ports, Goderich and Sarnia	4.59	8.78	6.80	5.11	—	—
Port Colborne	5.12	—	7.37	—	—	—
Toronto	5.81	12.19	9.38	6.90	7.89	—
Kingston	—	—	—	—	—	—
Prescott	7.11	11.99	8.99	—	—	—
Montreal	6.42	10.43	7.90	6.89	—	—
Sorel	6.36	10.32	7.80	—	—	—
Three Rivers	6.30	10.48	7.92	—	—	—
Quebec	6.35	10.34	7.81	—	—	—
Baie Comeau	6.31	—	7.85	—	—	—
Port Cartier	6.45	—	—	—	—	—
Halifax	11.43	—	14.90	—	—	—
Other Maritime Ports	25.51	41.86	23.75	—	—	—
Buffalo	—	—	11.87	—	—	—
Manitowoc	—	—	—	—	—	—
Milwaukee	—	—	8.09	—	—	—

* Preliminary report

APPENDIX B

Amendments to Canada Grain Regulations

Parliamentary legislation (Chapter 55 of the Statutes of Canada, 1976–77) which came into force by proclamation on February 1, 1978 amended several statutes relating to grain marketing. The effect of this legislation was to delete all references to Imperial units of measurement such as the bushel and pound, and substitute appropriate metric units such as the tonne and gram. The Canadian grain industry was then in a position to immediately implement metric conversion in grain handling operations, documentation and records. The Commission facilitated the conversion process by amending all relevant portions of the Canada Grain Regulations to establish metric units of measurement effective from February 1, 1978.

Effective August 1, 1978, grades and detailed specifications were established in Schedule III for two special grades of Canada Western Red Spring Wheat with a minimum protein content of 15%. These grades are part of an experimental program to facilitate the marketing and pricing of high grade red spring wheat with an above-average protein level.

Also included in amendments which became effective August 1, 1978 were revisions of Schedule I—Fees of the Commission, and Schedules VII, VIII and IX—Maximum Tariffs of Elevator Charges. The maximum tariffs were adjusted in instances where the Commission was satisfied that increases were justified by higher costs of elevator operation. The revised maximum tariff for terminal elevators included provision for a further upward adjustment of maximum rates for elevation of grain effective from January 1, 1979.

Western Grain Standards Committee as at August 1, 1978

H. D. Pound V. Duke Dr. G. N. Irvine P. Edwards		Chief Commissioner Chief Grain Inspector Chief Chemist Chairman, Grain Appeal Tribunal	}	Canadian Grain Commission
Dr. J. W. Morrison G. C. Pratt	}	representing the Canada Department of Agriculture		
F. M. Hetland		representing the Canadian Wheat Board		
H. Rowley J. D. Macgillivray	}	representing processors of grain		
E. V. Titheridge H. S. McDonald	}	representing exporters of grain		
J. D. Deveson E. Axelsen H. G. Yelland G. McEwen F. G. Brown F. E. Simpson R. Green R. Johnson N. M. Lorencz H. M. Sproule R. J. Thiessen C. Manness	}	representing producers of western grain		
J. E. Dehod J. Stangeland	}	additional*		

* Appointed pursuant to Section 17(2)(h) to provide additional expertise on Committee.

Eastern Grain Standards Committee as at August 1, 1978

H. D. Pound V. Duke Dr. G. N. Irvine		Chief Commissioner Chief Grain Inspector Chief Chemist	}	Canadian Grain Commission
Dr. J. W. Morrison		representing the Canada Department of Agriculture		
F. J. Reid D. D. Wright F. Beaudet	}	representing processors and exporters of grain		
P. MacKinnon L. Clark B. Sanford K. J. Hazlitt	}	representing producers of eastern grain		
M. H. McPhail W. Sim J. E. Peill	}	additional*		

* Appointed pursuant to Section 17(3)(e) to provide additional expertise on Committee.

APPENDIX C

List of Publications

Title	Issued
<i>Annual Report, Canadian Grain Commission</i>	Annually
<i>Canada Grain Regulations</i>	
<i>Canadian Amber Durum Wheat. Crop Bulletin</i>	Annually
<i>Canadian Barley. Crop Bulletin</i>	Annually
<i>Canadian Durum Cargoes. Bulletin</i>	Quarterly
<i>Canadian Flax and Rapeseed. Crop Bulletin</i>	Annually
<i>Canadian Grain Exports</i>	Annually
<i>Canadian Red Spring Wheat. Crop Bulletin</i>	Annually
<i>Canadian Wheat Cargoes. Bulletin</i>	Quarterly
<i>Exports of Canadian Grain</i>	Monthly
<i>Grain Elevators in Canada</i>	Annually
<i>Grain Grading Handbook for Eastern Canada</i>	
<i>Grain Grading Handbook for Western Canada</i>	
<i>Grain Research Laboratory Annual Report</i>	Annually
<i>Grain Statistics Weekly</i>	Weekly
<i>Map of Western Canada Showing the Protein Content of Hard Red Spring Wheat</i>	Annually
<i>Visible Grain Supplies and Disposition</i>	Annually
<i>Official Canadian Grain Grading Guide</i>	
<i>Specifications for Official Grades of Canadian Grain</i>	
<i>Stored Grain Pests</i>	
<i>Grain Deliveries at Prairie Points</i>	Annually
<i>The Key to Canada's Certificate Final is Uniform Quality</i>	

Further information on Grain Research Laboratory's scientific and technical publications will be found in the 1978 Annual Report of the Laboratory.

APPENDIX D

D-1—REVENUE—By Location and Division Fiscal Year Ended March 31, 1978

LOCATIONS	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics and Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Victoria								51
Vancouver		2211	1112	290			3613	2690
Prince Rupert		176	98			3167	3441	2149
Lethbridge		38				231	269	273
Calgary		67	34			678	779	579
Edmonton		21				1015	1036	1154
Saskatoon		52	25			1730	1807	2056
Moose Jaw		13				189	202	142
Churchill		251	129				380	314
Winnipeg	4	155	72	604		13	848	887
Thunder Bay		3949	2041				5990	5093
Toronto		17					17	18
Chatham		269					269	219
Montreal		34		53			87	67
Baie Comeau								23
Port Cartier		3					3	4
Three Rivers		1					1	4
Quebec		1					1	—
Sorel		2					2	2
Total Current Year	4	7260	3511	947		7023	18745	
Total Previous Year	7	6014	2893	654		6157		15725

* Elevator & Grain Documentation

** Grain Testing and Research

D-2—EXPENDITURES—By Location and Division
Fiscal Year Ended March 31, 1978

LOCATIONS	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics and Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Victoria			10				10	97
Vancouver		1362	894	269			2525	2371
Prince Rupert		95	75			2226	2396	3483
Lethbridge		87				497	584	500
Calgary	49	173	47			711	980	1061
Edmonton		96				773	869	1026
Saskatoon	41	118	37			2884	3080	2371
Moose Jaw		50				633	683	877
Regina	43						43	39
Churchill		27	41				68	87
Winnipeg	898	1879	507	1011	2770	366	7431	6101
Thunder Bay		3249	2078	395			5722	5818
Toronto		32					32	35
Chatham		293					293	273
Harrow	31						31	28
Montreal		550	93	69			712	621
Baie Comeau		60					60	91
Sorel		50					50	67
Port Cartier		72					72	64
Quebec City		89					89	70
Three Rivers		42					42	53
Employee Benefits	98	897	435	182	216	448	2276	2233
Total Current Year	1160	9221	4217	1926	2986	8538	28048	
Total Previous Year	1001	9092	4073	1775	2415	9010		27366

* Elevator and Grain Documentation

** Grain Testing & Research

D-3—REVENUE—By Type and Division
Fiscal Year Ended March 31, 1978

TYPE	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics and Statistics*	Research Laboratory**	Canadian Government Elevators		
				\$(000)				
Grain Sales								
—Samples		20					20	25
—Surplus						65	65	128
—Screenings						1071	1071	1605
—Weighovers						885	885	232
Services and Service Fees								
—Inspection		7211					7211	5981
—Weighing			3510			38	3548	2934
—Storage						880	880	912
—Elevation						2611	2611	2084
—Drying						217	217	138
—Cleaning						925	925	777
—Grain Documentation				903			903	608
—Other	1	7				165	173	116
Licenses				43			43	46
Refund of Previous Year Expenditures		18	1				19	—
Miscellaneous								
Grade Promotions						124	124	117
Other	3	4		1		42	50	22
Total Current Year	4	7260	3511	947		7023	18745	
Total Previous Year	7	6014	2893	654		6157		15725

* Elevator and Grain Documentation

** Grain Testing & Research

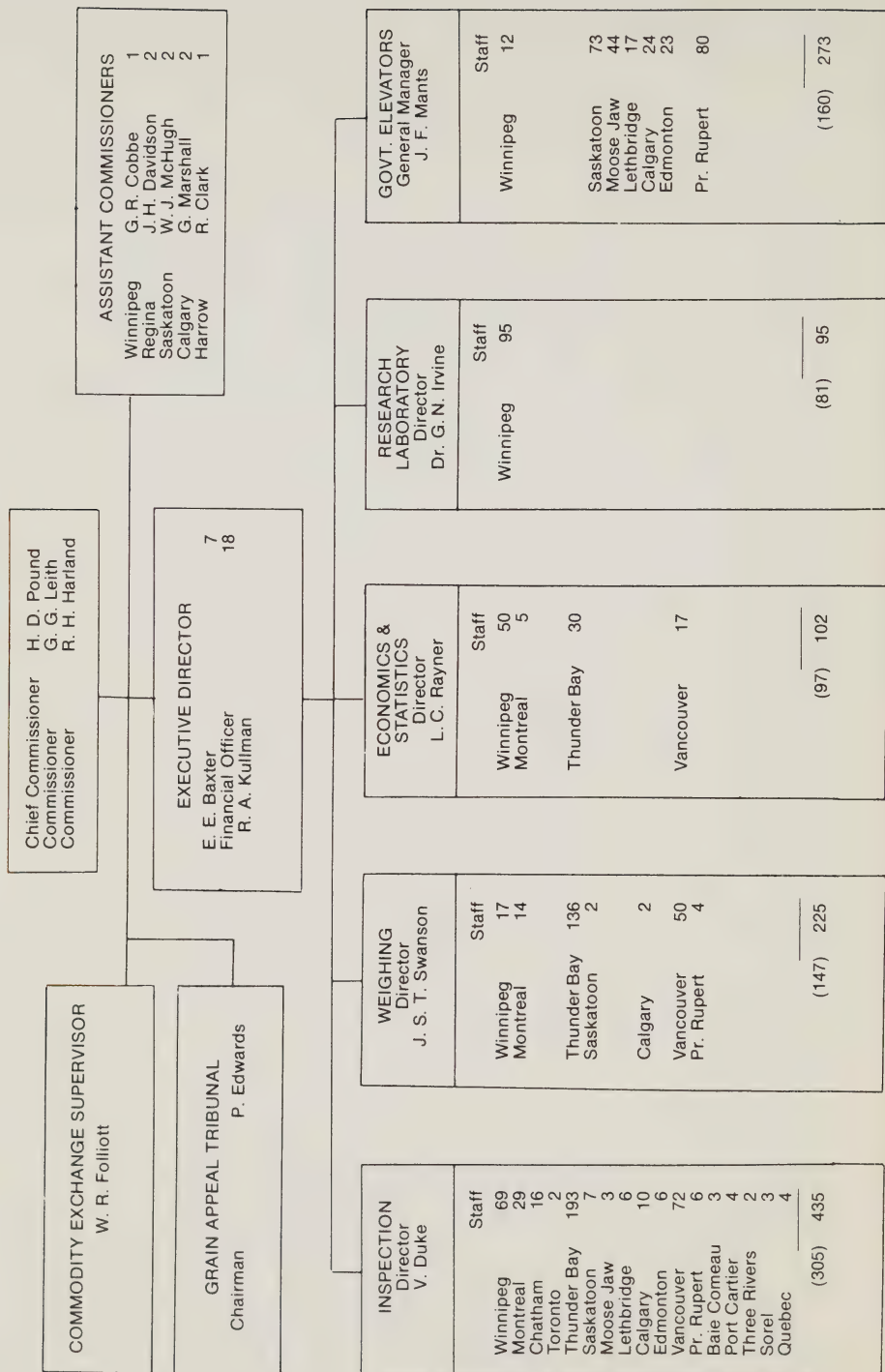
D-4—EXPENDITURES—By Type and Division
Fiscal Year Ended March 31, 1978

TYPE	DIVISIONS						Total Current Year	Total Previous Year
	Executive and Administration	Grain Inspection	Grain Weighing	Economics and Statistics*	Research Laboratory**	Canadian Government Elevators		
					\$(000)			
Salary & Employee Benefits Costs	793	8158	3919	1461	1709	3775	19815	18734
Travel	89	235	170	21	27	52	594	429
Postage, Freight & Cartage	40	177	1	2	16	14	250	209
Telephone/Telegraph	19	55	16	33	18	44	185	164
Advertising	1		1				2	3
Dept. Publications	3			26	22		51	37
Prof. & Special Services	31	9	3	13	20	95	171	153
Rent—Buildings —Equipment	139	325	46	133	548	674	1865	1828
Purchased Repair and Upkeep —Bldgs. & Works	3	5	2	188	6	22	226	219
—Equipment	2	1			10	19	30	6
Utilities		18	1	2	12	15	50	96
		1				384	385	280
Grants in lieu of Taxes						617	617	565
Screenings						131	131	165
Printing & Stationery	31	51	6	31	31	9	159	160
Other Materials and Supplies	4	52	4	3	128	498	689	707
Expenditures, Other	2	17	8	3	4	8	42	24
Grants & Contributions					2		2	1
Building Expenditures		36		2	80	277	395	697
Office Equipment	3	9	10	8	6	4	40	28
Other Capital Equipment		72	30		347	1900	2349	2861
Total Current Year	1160	9221	4217	1926	2986	8538	28048	
Total Previous Year	1001	9092	4073	1775	2415	9010		27366

* Elevator & Grain Documentation
 ** Grain Testing & Research

APPENDIX E

CANADIAN GRAIN COMMISSION



As at July 31, 1978
Includes full time and casual staff; figures in parentheses represent authorized full time man years





3 1761 1150844 2